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Editorial

THE EVER INCREASING FEES

"By order of the Board of Governors, the schedule of fees appearing on the pages of this insert will become effective at the opening of the session 1939-1940."

For the second time in their university careers, students of the two senior years find a familiar blue slip inserted inside the front cover of their calendar with no explanation of its presence. Many students have questioned the reason for the recent increase in fees which prompted an investigation by the Medical Society.

For reasons known to the Provincial Government, the grants to all departments have been materially reduced and Education has received its share of the cut. Accordingly the grant to the University of Toronto has been reduced by $100,000 which has necessitated an increase of $25.00 in the fees of every university student. The medical tuition fees, therefore, now stand at: first year $200, second and third years $275, and the three clinical years $300. When objections are raised to such increases, the authorities point out that the student pays only a fraction of the total cost of his education, the rest being borne by the Provincial Government. Statistics are not available on the cost of a medical education but the average cost of a university education amounts

approximately to $400 a year of which the student pays half. Another explanation offered is that the fees of a medical student at the University of Toronto are considerably lower than those of other Canadian and American universities. This statement, however, is not strictly true as the medical fees of the University of Western Ontario are somewhat less than ours.

Early in the investigation it was evident that it was quite possible to determine the reason for the increase but it was quite another matter to attempt to effect a reduction or even prevent further increases. Several interesting facts were discovered however.

The tuition fees in the early part of the present century amounted to $100 for all years. Contrary to present day customs, repeaters were apparently encouraged as the fees for a second attempt were only $50. In 1909 the fees were raised to $150 for each year and in 1927 the fees of the last five years were increased to $200. In 1935 the present spread of fees was inaugurated so that first year was $175, second and third years $250, and the three clinical years $275 each.

The full effect of these increases is felt of course by the student who plans for a university education with financial difficulty, and to become familiar with this aspect of the subject, we visited Mr. E. A. Macdonald, secretary-treasurer of the S.A.C.

Services Rendered by the Students' Administrative Council

The S.A.C. operates three services which are of immense value to the financially handicapped student, namely the loan fund, the employment bureau and the housing service.

To date it has been possible to loan approximately $25,000, more than $6,000 of which was distributed last year. The money is obtained through publications sponsored by the S.A.C., and from the small students' fee paid to the University for the Council. Need and ability are the determining factors in making a loan to a student and no interest is charged while the student is registered in the University. During the past few years, everyone who has applied for help has received it.

Last year 1,486 students secured profitable employment through the employment bureau, most of them earning sufficient money to enable them to complete the year without a loan. These students drive taxis, look after desks in private hotels and apartment houses in the evening, work part time in stores, wash cars, act as waiters in restaurants and as ushers in concert halls, etc. In the summer they operate refreshment booths, work on boats and buses, in boys' camps, mines, lumber camps, etc.

The housing service thoroughly investigates prospective rooming houses for students and draws up an approved list. Lower rates are obtained than the students could possibly arrange individually.

And so, in spite of the ever increasing fees, it is possible for the financially handicapped student to obtain a university education. The services rendered him by the S.A.C. are not forgotten as evidenced by the fact that a sum in excess of $1500 has been donated to the S.A.C. by graduates who have been helped by the services mentioned above, to be given without condition to those persons worthy of such assistance.

THE ARMY MEDICAL OFFICER

SURGERY

By R. I. HARRIS, M.C., M.B., F.R.C.S.(C.)
Associate in Surgery

The Editor's request that I contribute an article on war surgery has aroused mixed feelings in my mind. Few things in surgery which I have been privileged to do gave me as much satisfaction as did the surgery which it fell to my lot to perform in the last war. I would not have you misunderstand me. I mean, not that war gave me any pleasure, but that the surgical problems of war were such as to call forth one's best effort. War is grim and depressing and the casualties which result from it are ghastly. There is no pleasure in war, though there is adventure. In spite of this depressing background, there is much in war surgery to give the surgeon a profound sense of satisfaction. The medical service of the Army is one department for which no apology need be made. Its work is wholly scientific and humanitarian and of the highest quality. The satisfaction it engenders comes from work accomplished under arduous circumstances; from unexpected emergencies daily met and successfully solved; from ingenious measures devised to meet particular problems; from the salvaging of physical wrecks by advanced orthopaedic measures and from untold numbers of undying friendships made under the common bond of service.

Though I look back with interest on my own experiences in the war surgery of the last war, I never expected to face again the awful problems which are involved. It saddens me to think that again we must assume the task of caring for mutilated youth. The futility of war and of our great effort in the last war is dramatically brought home to us.

Moreover, it is not quite certain that the experiences of the last war will necessarily apply to this war. I suppose in broad outline the principles will remain the same, but almost certainly new problems will have to be faced and solved. This was true in the last war (gross infection in wounds, gas casualties, trench feet) and already one new problem has appeared in this war (disturbances in physiology due to high speed flying). Much will depend upon the kind of war which is fought. If it again is a war of entrenchments and fortresses, then the experiences of the last war will largely be duplicated. But if the war is open, a very different kind of war surgery may be expected, especially in the front line, and there is always the prospect that air warfare will introduce a new element.

War surgery is part—an important but still only an intregral part—of the medical services as a whole. In the front line it is inextricably mixed with all the other activities of the Army Medical Corps. There the surgeon must function as medical officer, sanitary officer, first aid man, transportation expert, architect, builder, contractor, purveyor, foot inspector, delouser, specialist in scabies, censor of letters and general friend of all the world, as well as a surgeon. It is not until the lines of communication are reached that surgical problems become segregated and surgeons can confine themselves to surgery.

War surgery segregates its problems into distinctive groups. This important segregation is dependent largely upon proximity to the front line and the time which has elapsed since the injury was received. The problems fall into four groups.

1. Surgery of the front line.
2. Surgery on the lines of communication.
3. Surgery at the Base.
4. Surgery of rehabilitation.

Surgery of the Front Line

In the line and for some considerable distance behind it war surgery is concerned with two problems: (1) emer-

gency treatment and (2) transportation. Of these the second is by far the most important. There is no surgery strictly speaking, certainly no operations, and yet what is done here is of the utmost importance. Rapid and gentle transportation is of as much importance in saving lives as are the operations which will later be performed. Indeed, there can be no operations unless the wounded reach a hospital quickly and with a minimum of shock.

Front line surgery is performed by Regimental medical officers and by Field Ambulances. All of the functions centre around the problem of rapid evacuation of the wounded. The Regimental medical officer establishes a regimental aid post to which his stretcher bearers bring in wounded. There he performs such simple first aid measures as may be necessary; haemostasis (with tourniquet), adequate dressing to cover wound, morphia for pain and shock, splints for fractures. The wounded man is then turned over to the advanced dressing station of a Field Ambulance situated usually in the reserve trenches or just behind them. At once he is transported to the main dressing station of the Field Ambulance somewhere in the vicinity of Brigade Headquarters (Field Ambulances are Brigade units). There a record is made (from which casualty lists are compiled) a tag is tied on his uniform, giving name, type of wound, a record of treatment (especially morphia and antitetanus serum). Urgent surgical cases are specially marked. Fractures are splinted for transport. After the briefest delay he is again transported to a Casualty Clearing Station where the surgery of the lines of communication begins.

Surgery on the Lines of Communication

Casualty Clearing Stations are units at the head of the permanent lines of communication. They are situated therefore as far forward on railroads and trunk roads as it is reasonably safe to establish semi-permanent institutions. Usually they are about five to ten miles behind the front line. In a war of fixed position as was the last war, some Casualty Clearing Stations remained in the same position throughout the war; No. 2 and No. 3 Canadian C.C.S.'s at Remy siding behind Ypres were two such. They are completely equipped small hospitals capable of handling every kind of *urgent* surgery. There the wounded are segregated into two groups. (1) Those who need immediate attention (abdominal wounds, chest wounds, brain wounds, wounds requiring debridement, shock, amputations). (2) Those whose wound and condition permits them to continue their journey. The latter go on to the Base. The urgent surgical problems are dealt with at once in the C.C.S. Here is done some of the finest surgical work in the war. Nowhere in the field of war surgery are the differences between war surgery and civil surgery so marked as in the work of a Casualty Clearing Station. All the surgical problems peculiar to war must be met here and at the moment of their greatest urgency. Upon the Casualty Clearing Station falls also the never racking problem of dealing with wounded in widely fluctuating numbers. During a quiet period there may be no more than ten admissions per day. During a great battle the wounded pour into a C.C.S. at the rate of thousands daily and for days on end. Under such circumstances the staff must work day and night and at the highest pitch.

During the last war the C.C.S.'s met and solved many of the problems which were new to surgeons trained in a long era of peace. First and most important was the gross infection of war wounds, of a magnitude and virulence undreamed of by those whose experience was obtained in civil surgery, and this meant all surgeons. Quickly the essential aspects of the problem were grasped; the great devitalization of tissue produced by shell wounds and the universal presence of anaerobic organisms in the heavily manured soil of France and Belgium. This led through a series of steps to the final success of debridement, i.e., early excision of devitalized tissue. By this measure the anaerobic organisms were deprived of the favourable nidus in which they grew and infection became a much less serious and much less fatal

problem. One can already see in the success obtained in the treatment of gas bacillus infection by sulfanilamide how greatly the progress of surgery in twenty-five years will modify the handling of this problem in the present war.

As you might expect, shock and haemorrhage are major problems in a C.C.S. An enormous proportion of all the more severely wounded have lost a considerable amount of blood and present a picture in which both shock and haemorrhage combine to reduce vitality to its lowest ebb and make major surgical procedures dangerous or impossible. It will interest you to know that the introduction of blood transfusion as a means of treating shock and haemorrhage in C.C.S.'s was due to the initiative and energy of one of our own University staff, the late Dr. Bruce Robertson. I have before me as I write the series of papers and reports (1. 2. 3) to the War Office which he published. You will be surprised to learn that during the early stages transfusions were performed without typing the blood of donor or recipient. The work of Jansky and of Moss on blood groups had just become known at the outbreak of the war and for a long time group II and III serum was not available for grouping. Dr. Robertson's final report (3) related his whole war experience based on sixty-eight cases. A small series, but it was pioneer work carried out under unbelievable difficulties by a man overwhelmed by the daily rush of work. Its importance cannot be overestimated for it introduced transfusion to the armamentarium of war surgeons and demonstrated the practicability of using it in front line units.

Harvey Cushing, whose recent death has deprived the surgical world of its brightest ornament, plunged wholeheartedly into the Great War on the side of the Allies. In 1914 he organized the Harvard Medical Unit and went overseas with it in the same year. From then until the end of the war he devoted his great energy and ability to the problem of cranial injuries. He quickly seized upon the C.C.S. as the unit in which head injuries should be treated and before the war ended he had succeeded in establishing special C.C.S.'s devoted entirely to head injuries to which such cases were diverted by Field Ambulances. This principle of segregation of urgent and special surgical problems to special C.C.S.'s marked one of the high spots in the surgical treatment of war wounded. Should this war develop into one of fixed position it will undoubtedly be used again.

Abdominal wounds and perforating chest wounds also constitute surgical emergencies which must be dealt with as quickly as possible and hence are treated in the C.C.S. The distinctive feature of the C.C.S. is this. Though it is almost in the firing line and indeed often is shelled and bombed, and though it is at the head of the fixed lines of communication, and is vitally concerned with moving wounded, it must also be a first-class hospital capable of dealing with all surgical emergencies, adequately equipped, performing work of the highest quality at topmost speed. All the special features of war surgery concentrate in a peculiar manner in a C.C.S.

But operations are not the only function of a C.C.S. It must also supervise the transmission of wounded to the Base. All the wounded who do not need immediate operation pass through the C.C.S. to the Base. All its own operative cases must be evacuated as quickly as possible to make room for fresh patients. Transportation of such cases introduces certain special surgical problems, notably the problem of splinting of fractures. It was in the field that the Thomas splint for transporting fractures of the leg proved of incalculable value.

Canadians may well take a special pride in the work of C.C.S.'s during the past war. Two Canadian C.C.S.'s (No. 2 and No. 3) stood at Remy siding behind Poperinghe during nearly the whole of the war. One of them (No. 2) was raised by this University and its *rank and file* (not officers) were members of my own year. (It might surprise you to know how many of your grey haired teachers started their war service in the last war as privates in No. 2 Can. C.C.S., scrubbing floors and carrying buckets.) Through these two C.C.S.'s passed the casualties of the Ypres salient and the

battle of Passchendale. Unnumbered thousands of wounded Canadians owe their lives to the surgery which was performed in the simple huts they occupied.

Surgery at the Base

Since we are discussing war surgery we may use the term Base in a broad sense to include hospitals in England (I am thinking of the last war) as well as in France. The surgical problems again are distinctive. The period of emergencies is over and the bulk of the work is concerned with the healing of wounds, the management of compound fractures and sepsis in general and in particular locations (chest, abdomen, head).

The management of compound fractures constituted a major problem. Fractured femurs cannot be transported very far. Consequently they were treated at the Base in France, often in special units. The simple and efficient method of treating fracture of the shaft of the femur which you will see in use in the Children's Hospital, was devised and used by Dr. A. B. LeMesurier in a special femur hospital in France. Many other new ingenious and effective methods were introduced and these have had a profound effect on modern fracture treatment. In a new war recent advances in fracture management would still further aid in this field.

Sepsis is an ever present problem. Some of the greatest surgical achievements of the last war were concerned with the conquest of sepsis. Debridement we have already mentioned. Debrided wounds were packed open and treated in a variety of ways. Of these the most famous and the most successful was that devised by Carrel and Dakin. Another much in use to-day for the treatment of osteomyelitis was the packing of wounds with vaselined gauze, first introduced by Fraser Gurd of Montreal and later greatly expanded and developed by Winnett Orr of Lincoln, Nebraska, as a means of treating osteomyelitis. Secondary closure of wounds developed as a measure for hastening healing.

Secondary haemorrhage, intestinal fistulae, septic arthritis, the recognition and removal of foreign bodies (shell fragments, bullets and clothing), the removal of sequestra, amputations to save lives from sepsis, gas gangrene, empyemas, spinal cord injuries, these and a host of other problems are met and solved at the Base.

Surgery of Rehabilitation

In due course the early problems of war surgery are mastered, the grossly damaged soft tissues are healed, the fractures are united, the osteomyelitis subsides to chronic discharging sinuses. The emergency phase, centred around the desperate effort to save life, passes into the next phase of war surgery which centers chiefly around the problem of how to improve the function of damaged limbs and maimed bodies. In the Canadian forces such cases were returned to Canada as quickly as feasible and the rehabilitation surgery was carried out largely in Canada. A large group of these patients presented orthopaedic problems and for this reason special orthopaedic centres were established to deal with them; at Buxton in England and the Dominion orthopaedic hospital at Christie Street in Toronto.

Abdominal wounds which did not kill the patient left behind them a high proportion of severe herniae. Ventral herniae of such a size as to be almost impossible to repair were common. It was such patients who first were treated by Dr. Gallie's living sutures and no more severe test of a new material and a new method for treating hernia could have been devised than the enormous abdominal wall defects which had resulted from shell wounds. You are all aware that the initial success achieved by fascial sutures in the treatment of such herniae has been extended to civil surgery and has become one of the great surgical contributions of our time.

Amputations are a major problem in war surgery. Great numbers of soldiers have their limbs blown off by shell fire; others suffer such serious damage that early amputation is necessary to save life and remove a useless limb. Still others must sacrifice a limb because of un-

controllable sepsis or because of damage to major blood vessels. To this large group who reach the period of rehabilitation must be added many others whose limbs are so seriously damaged that amputation is the wise method of treatment. Dr. D. E. Robertson has said in his recent Presidential address to the Academy of Medicine that it would have been wise to amputate limbs more freely and I agree with him. The time and effort spent in salvaging a badly damaged limb often proves disappointing. It would be better to solve the problem quickly by amputation and place the man back in civil life while he still has the initiative to re-establish himself.

The problem presented by amputations is to ensure a useful stump to which can be fitted a useful prosthesis. This often involves reamputation or remodelling of the stump. The Canadian Government solved the artificial limb problem by establishing their own limb factory. It still manufactures the best artificial limbs made on this continent. Those who are interested in the advances made in this field of surgery will find them well reviewed in an article by Dr. A. B. LeMesurier (4).

Sepsis in fractures constitutes another large group of cases. Here the well known course of chronic osteomyelitis in adult bone has to be faced. Multiple operations for the removal of sequestra and the obliteration of bone cavities are necessary. An outstanding feature of the osteomyelitis due to war wounds has been the high incidence of recurrences after long periods of healing. Often such recurrences are of extreme virulence and have been the cause of many late deaths.

Ununited fractures are numerous because of the great loss of substance which can be caused by shell wounds. Since all such nonunions are the late results of compound fractures, latent sepsis is always a factor which may mar the bone-graft. Nevertheless, this field of reconstruction surgery gives excellent, often brilliant, results; transforming useless limbs into those of good function.

Nerve injuries, though perhaps not as frequent as are some other problems, are of the greatest interest and importance. In the last war our knowledge of the surgery of nerve injuries was very fragmentary, especially the problem of what to do when a large gap existed between the severed ends. Many expedients to bridge the gap were used before the axiomatic fact was established, that no regeneration will occur unless end to end suture is performed. The problems accessory to nerve injury; causalgia, trophic changes and nerve transplantation, had to be faced and solved with almost no background of previous knowledge to help.

The whole field of reconstruction surgery of war injuries is filled with problems of interest and importance. Many are new and in many more, new aspects of old problems must be solved. There is scope for ingenuity and clinical research. Much of modern orthopaedic surgery is the outcome of the experience of the last war. The results are often all that the surgeon could desire; the complete transformation from helpless inefficiency to wage earning independence. The patients themselves are an exceptional group; young, vigorous, courageous and co-operative. The surgeon could not ask for a better opportunity to exercise his skill under circumstances where it will produce such great benefit and upon such a deserving group of individuals.

REFERENCES

L. Bruce Robertson

1. The Transfusion of Whole Blood. *British Journal of Medicine, July 8, 1916.*
2. Further Observations on the Results of Blood Transfusion in War Surgery. *British Journal of Medicine, 1917, 2, 679.*
3. Contribution to Blood Transfusion in War Surgery. *Lancet, 1918, 1, 759.*

A. B. LeMesurier

4. Amputation Stumps and Artificial Limbs. *Journal of Bone and Joint Surgery, Vol. 8, April, 1926.*

R. I. Harris

5. Operation for the Relief of Median Anaesthesia. *Journal of Orthopedic Surgery, September, 1920.*
6. Treatment of Irreparable Nerve Injuries. *Canadian Medical Association Journal, November, 1921.*

SOME OBSERVATIONS ON GYNAECOLOGICAL DIAGNOSIS

By J. C. GOODWIN, M.A., M.D.
Junior Demonstrator in Obstetrics and Gynaecology

PART II. DIAGNOSTIC AIDS

Before proceeding to review a number of the diagnostic aids it may be of interest to discuss briefly a few subjects of more recent interest from the diagnostic standpoint.

Pelvic Endometriosis

This is an interesting, though somewhat uncommon condition, which has been the subject of much study in the past few years. In this condition, the ovaries and the posterior surface of the broad ligaments and uterus become studded with minute implants of cells, which microscopically very closely resemble little bits of endometrium. Just how these implants occur is the subject of a number of theories which are not within the scope of this paper.

Under the stimulus of the ovarian hormones (Oestrin and Progestin) these implants in the pelvis undergo the same changes as occur in the endometrium within the uterus, i.e. they build up and break down each month, discharging minute amounts of menstrual fluid. This latter fluid is irritating to the peritoneum covering the surrounding structures in the pelvis, including bowel and omentum, and moderately dense adhesions are produced. These adhesions gradually enclose some of the actively menstruating implants and each month more and more menstrual fluid collects. Ultimately a cyst is formed containing the brownish menstrual liquid thus produced. The cysts are called Endometrial or *chocolate* cysts.

The symptoms of pelvic endometriosis are: gradually increasing pelvic pain occurring just prior to, and during menstruation, painful sexual intercourse, pain on defecation and occasionally on urination. The latter symptoms are more evident when bowel and bladder are considerably involved in the adhesions related to one or more of the endometrial cysts. On pelvic examination the condition is most often confused with chronic pelvic inflammation. Sterility is a common associated finding in endometriosis.

Trichomonas Vaginalis Infection

This condition closely resembles, but bears no etiological relation to gonorrhoea—and is not infrequently mistaken for it. Sometimes both conditions together are found in patients, and this accounts for the fact that purulent vaginal discharge and evidence of subacute inflammation appear to persist indefinitely where only gonorrhoeal treatment is given. Trichomonas vaginalis infection is associated with a profuse, greenish yellow foamy irritating vaginal discharge; and is caused by a uni-cellular parasite known as the Trichomonas Vaginalis. It is best diagnosed by placing a drop of the discharge in a little warm (95-100°) normal saline and examining a drop of the latter under the microscope. The parasite possesses a snowshoe-like shape and is observed wriggling among the pus cells which are very common in the discharge.

Sterility

The condition of sterility or inability to conceive may be classed as:

(*a*) Primary sterility—where the patient, even though married several years, has never conceived.

(*b*) Secondary sterility—where the patient has conceived on one or more occasions, but due to some cause is unable to conceive again. This may follow abortion, miscarriage or full term pregnancy.

The most common cause of both primary and secondary sterility is inflammation of the tubes and ovaries.

Gonorrhoeal infection is the most common cause of the latter. Primary sterility is not uncommonly related to underdevelopment, or other developmental abnormalities of the reproductive organs. Here, ovarian abnormalities of development are very rare—though underfunction or abnormal function is fairly common. Congenital stenosis of one or both Fallopian tubes is not uncommon. Secondary sterility is occasionally associated with a deep cervical laceration from a previous childbirth.

In order that conception may take place it must be remembered that the male germ cell deposited in the vagina must be healthy, and a healthy ovum must escape from the ovary. All factors must be favourable for their union in the Fallopian tube; and for the subsequent transmission to, and implantation of the fertilized ovum in the uterus. In considering the causes of sterility then, one naturally has to think of both the husband and the wife, and any investigation leaving out one or the other is incomplete. Consequently the husband should be examined and his semen checked microscopically to determine the presence or absence of active normal spermatozoa. The examination of the wife should determine the normalcy of her reproductive organs, both from the standpoint of their structure and their functions. Here one must inquire as to the character of menstruation and other evidences of normal functions of the genital organs. The genital canal must be opened from vaginal orifice to the ovaries. The canal of the tubes may be checked by the Tubal Patency test of Rubin (Insufflation of the tubes). This test will be described under Diagnostic Aids.

Other special examinations, laboratory tests, and occasionally minor and major operations are necessary to determine and correct the causes of sterility.

DIAGNOSTIC AIDS

The scientific era in medicine has produced a vast number of laboratory tests and other diagnostic procedures. These in practically every instance, have been devised to assist in the accuracy of diagnosis, not to prove a "short cut" to eliminate the usual methods of investigation. There is too great a tendency in recent times to place implicit reliance on an often abstract, often erudite interpretation of the results of the test tube, the microscope, the roentgenogram, etc. These procedures when arrayed in the light of the diagnostic sun tend to present a glittering spectacle which requires a steady trained eye to recognize their intrinsic value. Realizing that they are essentially secondary to the knowledge gained from sound clinical data, they may be of value however, in removing the film of obscurity which presents itself in some cases. A few interesting and useful gynaecological diagnostic aids will be discussed briefly.

1. The Sedimentation Test

By this test one observes the rapidity with which the cells in citrated blood sediment or settle down. Lohr, using one hundred and ten healthy subjects, showed the time for the normal complete sedimentation of the red blood cells to be: (*a*) in men 1200-1400 min.; (*b*) in women 850-1000 minutes; (*c*) in children 300 minutes. Inflammatory processes, tissue destruction (malignancy and necrosis), pregnancy, internal haemorrhage, etc., are manifested by increased rapidity of sedimentation. Employing the Linzenmeier-Friedlander method a sedimentation rate of over 1 hour or more is regarded as normal. The most rapid rates, as low as 10-15 minutes, are found in acute virulent infections such as are found in cases of puerperal sepsis, pelvic abscess, acute salpingitis, etc. Rapid sedimentation is almost a constant finding in Streptococcus haemolyticus infections. This test has been stated by Baer and Reis to be an index of virulence, as well as resistance to infection. Slow readings, i.e., over sixty minutes, may be taken to exclude the possibility of serious infection regardless of the white blood cell count or elevation of temperature. Hence it is of value for instance in the differential diagnosis between ectopic pregnancy and salpingitis, as in the former the rate will be slow. A safe rule is never to perform

an elective operation in the presence of a sedimentation rate of less than one hour, otherwise a febrile or stormy convalescence may be expected. In inflammatory cases the rise in sedimentation rate to sixty minutes is practically always accompanied by quiescence and beginning resolution of the infective process. If surgery is required, the risk to the patient is consequently decreased, because of the establishment of her immunity to the infective organism. In one large series of cases (presented by Yates et al) in which the sedimentation test was employed routinely, there was a 91.4% accuracy in the correlation of the test with the pathological findings. The test is very easily performed and its use is commended as a valuable diagnostic aid.

2. The Anterior Pituitary-like Hormone Test for Pregnancy

A number of recent articles in the literature have attributed to the accuracy of a relatively simple test for pregnancy. In this test anterior pituitary-like hormone (A.P.L., Antuitrin-S) is injected intradermally. The theory involved in this test is that in a pregnant woman an anterior pituitary-like substance is present in the system. The pregnant patient having this substance in her system will show no reaction to this substance when it is injected intradermally; whereas the non-pregnant woman will be sensitive to this material. For this test two minims of A.P.L. or Antuitrin-S are injected into the skin of the volar surface of the forearm. No alcohol is used to cleanse the skin, or in the preparation of the syringe used for the injection. The Anterior Pituitary-like hormone preparation must be fresh. In one-half to one hour in the non-pregnant patient an area of erythema develops about the site of the injection, measuring from 7 to 40 mm. in diameter. In the pregnant patient, apart from slight reddening of the wheal no erythema is observed. A reaction indicating the absence of pregnancy usually begins in 1 to 3 minutes, though in patients above 30 years of age the erythema may develop more slowly—in some cases requiring as long as 3 hours for full development. In patients in which pregnancy has been known recently to exist, the presence of some chorionic cells remaining in the uterus may be associated with an erythematous reaction within 20 minutes; but the erythema will have disappeared within half an hour. This hormone test for pregnancy is interesting though not generally used; and because of its essential simplicity is worthy of trial as an aid in the diagnosis of intra or extra-uterine pregnancy when it is impracticable to obtain or to wait for the results of an Aschheim-Zondek Test.

3. The Aschheim-Zondek Test

The presence in the blood and urine of pregnant patients of ovary-stimulating anterior pituitary-like hormones having a characteristic effect on the ovaries of immature mice led Aschheim and Zondek to utilize this as a biological test for pregnancy. In this test carefully collected morning urine from a case of suspected pregnancy is injected into immature female mice. In three to four days the animals are autopsied and inspected for "blood points" in the ovaries and other characteristic evidence denoting a positive test, i.e., indicating the existence of pregnancy in the patient whose urine was used. This test has been found to be 98-99% accurate. It is obvious how valuable this test is in the differentiation of ectopic pregnancy, salpingitis, pelvic tumours, etc. The test is positive using diluted urine in cases of Hydatidiform Mole, and Chorionepithelioma, and this dilution feature is almost diagnostic. It is a useful index of a cure, becoming negative when all the tissue of the Hydatidiform Mole or Chorionepithelioma has been removed. It is interesting to note that the test remains positive for 96 hours following normal delivery. If positive after this time it is stated to represent evidence of retained placental (chorionic) tissue. In the Friedman modification, immature female rabbits are employed instead of mice, and a report may be given in 48 hours instead of 3-4 days.

4. The Rubin Test

In this test CO_2 is passed aseptically, under controlled pressure into the uterus via the cervical canal; with its subsequent escape through the fallopian tubes into the peritoneal cavity. This denotes a positive test, i.e., indicating tubal patency; and this is evidenced further by a fall in pressure as shown by a manometer included in the apparatus, as well as by auscultation over both iliac fossae. With the latter one hears a hissing sound which indicates the passing of the gas through the tubes. This test was originally devised to demonstrate tubal patency in cases of sterility. Failure of the gas to pass through indicates tubal obstruction which may be due to congenital causes such as malformation, atresia, absence of tubes or to acquired causes such as inflammatory adhesions of mucosa of tubes, neoplasms, etc. Temporary tubal blockage may be due to tubal spasm, which usually disappears if one waits a few minutes and proceeds again very slowly. Thus the finding of a positive test is conclusive of patency, but when negative it does not necessarily mean obstruction, as spasm sometimes persists. If there is no evidence of recent genital or pelvic infection, this test may be employed with reasonable safety.

5. Hysteroscopy

By this is meant the visualization of the interior of the uterus with an instrument called the *Hysteroscope*. This is a device very similar to the cystoscope. This procedure is not in general use among gynaecologists, but its advocates claim its usefulness to lie in a further study of the interior of normal and pathological uteri. Material may be obtained for microscopic section with fairly accurate knowledge regarding the site from which it is obtained. An instrument having a similar purpose, namely to extend the range of vision, is the proctoscope, and its close associate the sigmoidoscope. These are commonly employed to assist in diagnosis. Here, direct visualization of the interior of the rectum and sigmoid is possible. This is of great importance in the diagnosis of intrinsic lesions in this location such as carcinoma. It must be remembered that cancer of the rectum and sigmoid may be confused with inflammatory or other lesions of the uterus or adnexa. Any gynaecological lesion associated with a pelvic mass and in which symptoms exist such as constipation, abdominal cramps, a sense of pressure within the pelvis, or bleeding from the bowel, should make one suspicious of carcinoma or other lesions of the lower bowel.

6. Roentgenological Procedures

The X-ray is of great value in the visualization of pelvic deformities, lesions of lower spine and pelvic joints; and materially assists in the diagnosis of extra-genital causes of pelvic symptoms. In recent years methods have been devised for the visual study of pelvic viscera, normal and otherwise. The work of Rubin, Peterson, Jarcho, Stein, and Stein and Arens is notable in this regard. Their roentgenological methods employ the transuterine or transperitoneal insufflation of CO_2 gas; and subsequently taking an X-ray plate of the lower abdomen and pelvis. This indicates the outline of the pelvic viscera, tumour, etc. The injection of media opaque to X-rays into the genital tract via the cervix, alone or secondary to the insufflation of CO_2, produces even a more remarkable picture showing the interior of the uterus, and if patent, the tubes, as well. Iodized oils such as Lipiodol are the most useful substances for injection, resulting in no apparent harmful after-effects. The advocates of the above roentgenological procedures claim that by these methods it is possible to secure the maximum information as to the genital status short of surgical exploration. It is obvious that these tests must be employed intelligently, and performed with great care. Experience is necessary in interpretation of the plates. Most authorities are agreed that such procedures are rarely needed where the patient can be kept under careful clinical study and observation for a sufficient period of time. It should be reiterated that the sole object in using

them should be to assist in making an accurate diagnosis, rather than to replace the usual diagnostic methods. To illustrate how unwisely such procedures can be used, intrauterine lipiodol injection was advocated a few years ago for the early diagnosis of pregnancy. This deservedly possessed little popularity, and was discarded with the advent of the Aschheim-Zondek test.

A substance, Uroselectan injected intravenously, is subsequently excreted by kidney, rendering the urine opaque to the X-ray. This test enables one to obtain remarkable visualization of the entire urinary tract, and because of the simplicity and safety of this method, it has become very popular. It has largely replaced the use of opaque media injected into the renal pelves through ureteral catheters for the same purpose. Uroselectan then, enables the gynaecological observer to outline the urinary tract in relation to pelvic lesions, to differentiate a displaced kidney from a pelvic tumour and to localize the site of ureteral, vesico-uterine and vesico-vaginal fistulae, etc.

Pages from the Past

HISTORIES OF CERTAINE MELANCHOLIKE PERSONS, WHICH HAVE HAD STRANGE IMAGINATIONS:

"I have read that a young schollerbeing in his studie, was taken with a strange imagination: for he imagined that his nose was so great and so long, as that he durst not stirre out of his place, least he should dash it against something: and the more he was dealt with and disswaded, so much the more did he confirme himselfe in his opinion. In the end a Phisition having taken a great peece of flesh, and holding it in his hand secretly, assured him that he would heale him by and by, and that he must needes take away his great nose: and so upon the suddaine pinching his nose a little, and cutting the peece of flesh which he had, he made him believe that his great nose was cut away."

* * *

"There have been seene very melancholike persons, which did think themselves dead, and would not eate anything: The Phisitions have used this sleight to make them eate. They caused some one or other servant to lie neere unto the sick partie, and having taught him to counterfeite himself dead, yet not to forsake his meate, but to eat and swallow it, when it was put into his mouth: and thus by this craftie devise, they perswaded the melancholike man, that the dead did eate as well as those which are alive."

* * *

"The pleasantest dotage that I ever read, was of one Sienois a Gentleman, who had resolved with himselfe not to pisse, but to dye rather, and that because he imagined, that when he first pissed, all his towne would be drowned. The Phisitions shewing him, that all his bodie, and ten thousand and moe such as his, were not able to containe so much as might drowne the least house in his towne, could not change his minde from this foolish imagination. In the end they seeing his obstinancie, and in what danger he put his life, found out a pleasant invention. They caused the next house to be set on fire, & all the bells in the towne to ring, they perswaded diverse servants to crie, to the fire, to the fire, & therewithall send of those of the best account in the town, to crave help and shew the Gentleman that there is but one way to save the towne and that it was, that he should pisse quicklie and quench the fire. Then this sillie melancholike man which abstained from pissing for feare of loosing his towne, taking it for granted, that it was now in great hazard, pissed and emptied his bladder of all that was in it, and was himselfe by that means preserved."

A Discourse of the Preservation of the Sight; of Melancholike Diseases; of Rheumes, and of Old Age.

M. Andreas Laurentius,
(translated by Richard Surphlet—1599)
—Oxford University Press.

AMOEBIC ABSCESS OF THE LIVER

By W. M. TOONE, B.A., M.D., D.T.M.&H. (Lond.)
Afghan Mission Hospital, Peshawar, India

With the speeding up of travel, vast movements of armies and a greater number of people going south for their holidays, the door of temperate climates has been thrown open to diseases of the Tropics. There are certain manifestations of these diseases which seem to be accentuated under the stimulus of a more temperate climate. Unless practitioners have these conditions in mind a diagnosis will be missed or deferred until it is too late. Such a condition is amoebic abscess of the liver.

Etiology

Liver abscess or hepatic amoebiasis is a direct complication of amoebic dysentery. It may occur during the attack or as in a case cited by Carmichael Low, twenty years after the appearance of dysentery. How often does liver abscess occur in amoebiasis? Woodward states in 3,680 dysentery autopsies, 779 or 21% revealed liver abscess. The incidence is generally considered to be about 10%. Liver abscess is rare before ten and after fifty years of age, being most prevalent between twenty and forty. Women are rarely affected, ninety-five per cent of the cases seen in the London Tropical Hospital were among men. Exposure, fatigue, and change of climate are incriminating factors.

Anatomy and Pathology

The spread of liver amoebiasis is from the intestine to the liver by way of the portal vein. Rogers believes it occurs with greater frequency in the right lobe of the liver and in 80%, the right upper lobe. There appears to be an important anatomical reason for this fact. McQudoc and Counsellor by injections of trypan blue into the portal vein and hepatic artery have shown that the liver is divided into right and left lobes by a line drawn from the fundus of the gall bladder backwards to where the inferior vena cava grooves the liver and not by the anterior-posterior fissure. Copher and Dick have demonstrated that three distinct and separate currents run in the portal vein. The lodging therefore of amoebae in the right lobe of the liver is brought about by a stream line phenomenon and is purely mechanical.

Pathology

In its early stages there is a general congestion and enlargement of the liver. Then one or more small greyish areas appear (which are responsible for single or multiple liver abscesses). These areas increase in size, undergo liquefaction and ragged soft abscess cavities are formed. Amoebae are found at this time in the walls of the cavity and the pus is the colour of anchovy sauce; the pus itself is sterile unless secondarily infected. Later, as the amoebae die out, the contents of the cavity become greyish in colour.

Symptoms

The symptoms of amoebic abscess are sometimes so classical that the diagnosis is most easy, but at other times the picture is by no means so clear. Cholecystitis, duodenal ulcer, appendicitis, pleurisy and tuberculosis are diseases simulated. Generally it is a middle aged man who has resided in the tropics and has suffered from subacute attacks of dysentery. It is well to note that he may not remember having had dysentery and the liver abscess may be the first symptom of amoebiasis. There is a continuous remittent fever, with drenching night sweats, anorexia and exhaustion; emaciation and a slight icterus give the patient a characteristic cachectic appearance. A weight may be felt in the hypochondrium and a sense of fullness, cough and shoulder pain may be experienced. Rigours in the evening may or may not be present.

Signs

The liver is enlarged upwards or downwards and is tender; rarely the abscess forms a fluctuating mass beneath the ribs. Tenderness on pressure over the thoracic wall and oedema of the intercostal spaces may indicate the situation of the abscess. There is pain in the chest on turning over in bed and the patient holds his side, so he is said to *carry his abscess under his arm.* Fluid, diminished air entry and other signs are often found in the chest. Abscess of the left lobe generally presents in the epigastrium. Multiple abscesses are fortunately rare, for they are difficult to diagnose and to treat. Leucocytosis is marked, 15-30,000 but without the polymorphonuclear preponderance found in the usual suppurative processes. All cardinal signs may be absent and the first indication of the condition is the coughing up of a great quantity of pus. Thus a patient with unexplained asthenia and fever and of a muddy colour must have liver abscess ruled out.

Complications

Rupture into the lung is the most common accident, giving rise to a lung abscess. This may rupture into the lower bronchus and the drainage will be sufficient in most cases provided emetine is also given.

Rupture into the peritoneum is not as dangerous as one might imagine. Drainage of the abscess and of the peritoneal cavity combined with active medical treatment usually results in a cure.

Rupture into the pleural or pericardial sacs are serious emergencies and must be treated at once. The abscess may rupture into stomach, colon, renal pelvis or vena cava. Metastases to other parts of the body are extremely rare. The abscess of course may go on to calcification.

Diagnosis

Cysts of entamoeba histolytica are found in the faeces of 45% of cases. X-ray examination may reveal an elevated diaphragm, rounded or with a tenting appearance along its surface; pleural effusion and a residual sinus up to lung abscess from the liver. In abscesses of long standing the walls or indeed the whole abscess may be calcified. Diagnostic aspiration should be made to confirm the diagnosis.

Treatment

Rogers emphasizes that the treatment of liver amoebiasis should begin with emetine. This is especially true if hepatitis is present which has not yet gone on to abscess formation. If at this stage thorough emetine treatment is carried out, hepatitis can be cleared up before necrosis and abscess formation have occurred. Emetine should be injected grains one for 12 days. If cysts are present in the faeces, a combined course of emetine bismuth iodide grains two in the evening and ounces eight of a $2\frac{1}{2}\%$ solution of yatren in the morning for ten days yields the best results. Everything should be done to build up the patient's general condition and time is well spent in this regard.

If an abscess is present, aspiration must be undertaken along with the treatment by emetine. Aspiration should always be done in the theatre, for open operation may be necessary. Local anaesthesia is excellent if the patient cooperates; otherwise gas and oxygen is better. Clinical localization and x-ray are the guides to aspiration. A good point of entrance is the eighth or ninth interspace in the anterior axillary line. A three and a half inch needle of large bore is used, inserted to its full length towards the most usual place for liver abscess, viz. the upper and posterior part of the right lobe. The needle must be allowed to swing as it moves forward, for firm pressure will tear liver tissue as the liver moves on respiration. If pus is not obtained, remove the needle and try in different directions, at least six attempts should be made. The inferior vena cava lies 4 inches from the surface in all directions so the needle must not be pushed beyond $3\frac{1}{2}$ inches. Pus when found should be forcibly aspirated, with negative pressure maintained using a

vacuum bottle. When all the pus has been aspirated it is measured and one half its volume of $\frac{1}{1000}$ Quinine or $\frac{1}{1000}$ yatren is injected, allowed to remain for five minutes and aspirated again. This may be repeated until the fluid returns clear. Ninety per cent of cases can be cured by this method.

Indications for Open Operation

With the conservative method indicated above the old high mortality at one time prevalent in this condition has been considerably reduced. Open operation however must be resorted to if: 1. After repeated punctures, pus is not obtained and one is convinced that a liver abscess is present. 2. When an abscess is pointing in the epigastrium the needle cannot be plunged in for fear of injuring the bowel. 3. Where a large amount of pus is present which fails to respond to repeated aspiration or if it is secondarily infected. 4. Multiple abscess of course must be treated in this manner.

Operation

If the abscess is in front, enter transperitoneally through a high right rectus incision and pack the abdomen off thoroughly. A large tube packed around with iodoform gauze is used. When behind, a two stage trans-pleural operation is indicated. Bare two ribs and place iodine packs between soft tissue and ribs. This will give adhesion between parietal and diaphragmatic pleura if left in the wound for seven days. Then resect a portion of the ribs, find the abscess with an aspirating needle and put in a finger, sweeping it around the wall of the cavity to break down various loculi which may be present. The operation is completed by placing in a large tube reaching down to the bottom of the cavity. Each day the tube should be washed out with eusol solution leaving the cavity full of solution at the end of the washing. On no account must the tube be removed until pushed out by the abscess cavity. A patient undergoing treatment by open operation must be treated before and after operation with emetine.

Pages from the Past

ON THE NERVOUS DISORDERS OF INFANTS:

"The various affections of the nervous system, so common in infancy, seem to depend very much upon "Fruitless Sucking," as their remote cause. They are probably manifestations of a defect either in quantity or quality of the pablum necessary for the growth or nutrition of the nervous centres, an error which may be easily conceived to occur, when we consider the injury that is inflicted upon the organs concerned in the first processes of digestion, by the continual and excessive flow of gastric juice through the stomach and intestines. And if it is a fact that these nervous disorders only occur after a continuance for some time of green-stool diarrhoea, I think we may fairly assume, that the above explanation of their cause is not an extravagant one."

ON INFANT MORTALITY:

Deaths in England, in 1857

	Under 2 years of Age	*Between Ages of 2 and 5*
Diarrhoea	15,390	1,238
Dysentery	582	126
Cholera	506	72
Enteritis	1,184	236
Ulceration of Intestines	93	22
Diseases of Stomach	361	109
Intus-susception	60	6
Tabes Mesenterica	3,713	928
Thrush	1,133	14
Hydrocephalus	4,691	1,739
Cephalitis	956	632
Convulsions	22,428	1,624
Teething	3,791	201
Diseases of Skin	203	16
	55,091	6,963

(Births in England in 1857, were 663,071.)

Diseases Peculiar to Infants and Mothers,

THOMAS BALLARD, M.R.C.S.—1860.

A PROBLEM IN DIAGNOSIS

SUMMARY OF CLINICAL FINDINGS

By W. A. OILLE, M.D.

Mr. L. A., fifty-one year old negro labourer, Ward G, July 27th to August 13th, 1939. In usual good health until 2 p.m. July 17th, when he suddenly became unconscious and remained so for six hours. During this period he had flaccid paralysis of left arm and bilateral extensor plantar response. The neurological signs cleared on regaining consciousness and the only symptom persisting until admission was severe, generalized headache with pain down back of neck. No further pertinent information from history.

Examination

Temperature 99; respiration 20.

Negro of about fifty-five years, drowsy, holding his head between his hands, lying quietly in bed.

Chest—clear.

Cardio Vascular—B.P. 135/85. Heart not enlarged. Regular rhythm. No murmurs.

Abdomen—no tenderness, palpable masses or organs.

Nervous system—cooperative, drowsy, some loss of memory for events of past two weeks. Disorientation as to time. Stiff neck. Cranial nerves intact. Tendon reflexes active and equal. Superficial reflexes normal response. No muscular weakness, wasting or fibrillation. No alteration in tone. No sensory changes to touch, pain, heat or cold. Coordination and position sense normal. Ophthalmoscopic negative.

Laboratory

W.B.C. 12.6: 70% polymorphonuclears, 25% lymphocytes. Hb. 103%. R.B.C. 4.8. Urine clear. Lumbar puncture—pressure 170 mm., fluid xanthochromic. Pandy 3+, 26 lymphocytes per c.mm., serology and colloidal gold curve normal. Blood Wassermann negative.

Course

General condition improved slowly. No new signs developed. At 7.30 a.m. on August 10th, suddenly became unconscious, pale, sweating. Pulse 60; temperature 102; respiration 25; B.P. 65/45. Left sixth and seventh cranial nerve weakness. Left arm and leg paralysed. Bilateral extensor plantar response. Absent abdominal reflexes. Lumbar puncture—pressure 230 mm. C.S.F. Gross blood present, fluid xanthochromic. August 10-13, patient remained comatose. Temperature rose steadily to 106. Pulse rose to 140. B.P. remained low. Respiration increased to 40, becoming Cheyne-Stokes in character. Patient died on August 13th, 1939.

SUMMARY OF AUTOPSY FINDINGS

By E. B. TOVEE, M.D.

A complete autopsy was performed 16 hours after death.

The body was that of a well developed and well nourished 51 year old male. The findings of interest were almost entirely confined to the contents of the *cranial cavity*. The calvarium was normal. The dura was intact and pearly grey in colour and all the venous sinuses contained only fluid blood. The brain weighed 1650 grams. The leptomeninges were smooth and delicate and disclosed blood-tinged fluid in the subarachnoid space with a more marked suffusion of blood over the right occipital cortex. The convolutions of the cerebral hemispheres were ironed out and a marked degree of herniation of the cerebellar tonsils and the biventral lobules had occurred through the foramen magnum. The right cerebral hemisphere was larger than the left and the medial surface of

the right frontal lobe bulged into the concavity formed by the medial surface of the left frontal lobe. A recent diffuse blood clot was adherent to the orbital surface of both frontal lobes between the gyri recti and anterior to the optic chiasma. The removal of this blood clot allowed separation of the frontal lobes in the longitudinal fissure. Arising from the junction of the anterior cerebral artery and the anterior communicating artery was a swelling the size of a small cherry partially buried in an excavated area of frontal lobe. This proved to be a so-called "berry" aneurysm filled with dark brown thrombotic material. In its antero-superior aspect a linear perforation 2 mm. in length was found pointing into a soft, haemorrhagic cortical laceration of the gyrus rectus of the right side. On horizontal section of the brain through the basal ganglia an irregular defect filled with blood clot was seen to occupy a large portion of the white matter of the frontal lobe. This cavity extended upwards, demolishing the fibres of the forceps minor, intersecting the medial fibres of the corona radiata and communicating with the anterior horn of the lateral ventricle. The wall of the cavity was composed of ragged white matter stained a dirty brown colour. Both lateral ventricles and third ventricles were filled with dark red blood clot. In the posterior horns were many bright red pin-point haemorrhages which were especially marked in the region of the calcar avis. The remainder of the cerebral vessels showed no gross arteriosclerotic thickening.

The *heart* was moderately hypertrophied weighing 440 grams. The myocardium was soft and flabby but apart from some thickening of the wall of the left ventricle and slight arteriosclerosis of the coronary arteries showed no marked pathological changes.

The left *lung* weighed 440 grams and the right 550 grams. A small amount of superficial collapse was accompanied by a moderate basal bronchopneumonia.

The *kidneys* were within the limits of normal, the left weighing 160 grams and the right 130 grams. The thin capsules stripped with difficulty disclosing a few deep linear, arteriosclerotic scars on the cortical surface. Otherwise the cortex was smooth and of a uniformly brownish-pink colour. Cross sections of both kidneys revealed no other lesions.

The *thyroid*, *liver*, *spleen*, *pancreas*, *gall bladder*, *adrenals*, *prostate* and *bladder* were normal.

The *microscopic findings* were relatively unimportant. The lung bases showed a typical patchy bronchopneumonia. The remaining sections were normal.

DISCUSSION

This man previously well, suddenly developed unconsciousness with transient weakness of the left arm. On regaining consciousness he had persistent headache and pain in the neck and back. Examination in hospital ten days later showed a stiff neck and xanthochromic spinal fluid. This is a fairly characteristic story of primary or spontaneous subarachnoid haemorrhage, which is known to be usually caused by rupture of a saccular aneurysm of the Circle of Willis. The second, fatal, apoplectic attack was accompanied by a severe left hemiplegia and fresh blood in the spinal fluid. This suggested massive haemorrhage into the right cerebral hemisphere as well as into the subarachnoid space, probably into the area damaged by the initial haemorrhage.

The clinical diagnosis was ruptured aneurysm of the right side of the Circle of Willis with subarachnoid and intracerebral haemorrhage.

The autopsy findings substantiated the clinical diagnosis of ruptured intracranial aneurysm. Furthermore, pathologically it was a typical picture of an aneurysm of the cerebral vessels occurring in one of its commonest sites—the junction between the anterior communicating and anterior cerebral arteries. The aneurysm had ruptured with sufficient force to plough up the right frontal lobe to a marked degree and then break through into the anterior horn of the lateral ventricle, filling the entire ventricular system with gross blood.

CONGENITAL PYLORIC STENOSIS

By R. P. McCAFFREY, '40

This condition, which is not an uncommon one, is variously known by such other names as Hypertrophic Pyloric Stenosis, Congenital Hypertrophy of the Pylorus, Pyloric Stenosis of Infancy and Congenital Hypertrophic Pyloric Stenosis which is probably the most descriptive. It may be described as an enormous congenital hypertrophy of the circular muscle fibres of the pylorus with varying degrees of associated spasm.

Incidence

As the name implies that it is a congenital condition, it is seen as one would expect, in early infancy—usually in the first two months following birth but seldom before the first two weeks. The condition occurs predominantly in the male, over 75% of cases being seen in this sex. Curiously enough the disease is said to be more frequent in well to do families where special care is given to the child's dietaries. Many authorities dispute this statement claiming that it is no more common in artificially fed babies than in breast fed infants.

Etiology

Many observers hold very diverse opinions as to the pathogenesis of the condition. It is believed by some that the primary condition is one of spasm; that the hypertrophy when present is secondary; that in a considerable number of cases there is only spasm without hypertrophy and that the spasm is due to injudicious feeding especially the giving of food before the mother has milk in her breasts. The other most cited view is that the primary condition is one of hypertrophy which is congenital and that to this, spasm is added and that in all cases both factors—hypertrophy and spasm—are present in varying degrees. This latter view seems to harmonize best with the clinical picture of the malady and the pathological changes found at operation or at autopsy.

Signs and Symptoms

The signs and symptoms may appear during the first week of life or as late as two to three months following birth but the usual picture is that of an infant who for the first week or ten days has shown no evidence of gastric disorder, and often has been nursing and gaining regularly in weight, begins without evident cause to vomit, at first occasionally, but soon habitually. The vomiting soon begins to become forcible and then projectile or it may be of this type from the start. Changes in diet have little or no effect. The usual symptoms of indigestion, such as might be expected with the vomiting, are absent. The tongue is ordinarily clean, the appetite excellent, the colour is usually good and there is no fever. The bowels are constipated. The child wastes steadily and often loses one to two ounces a day. There is progressive failure in nutrition, usually subnormal body temperature, and death may occur from inanition in from four to six weeks from the beginning of marked symptoms.

The manner of vomiting is characteristic. It is more forcible than in any non obstructive condition. The word projectile well describes it. It is usually related to the taking of food most often coming on directly after feeding and may be immediately preceded by signs of pain. After an attack of vomiting, nursing is sometimes resumed with great avidity, showing a distinct absence of nausea or anorexia. All food is generally expelled at one time; frequent regurgitation of small amounts is unusual but often two or three feedings may be retained and then expelled all at once. Owing to the loss of fluid by vomiting, the infant may become greatly dehydrated; the skin becomes dry and inelastic and the urine is scanty. Alkalosis results because of the loss of hydrochloric acid which is four to five times as great as the loss of base by this route and may be so severe as to go on to tetany.

The usual plasma electrolytes picture is a marked reduction of plasma chloride, a slight lowering of plasma fixed base and a compensatory elevation of bicarbonate.

Obstinate constipation is the rule due to the food vomited. Occasionally there may be diarrhoea consisting mostly of mucous and other secretions and rarely when obstruction is complete the stools may resemble meconium.

Progressive wasting is one of the most striking symptoms. The rate of loss depends of course upon the completeness of the obstruction and is proportionate to the amount of vomiting.

On examination of the abdomen the epigastrium is usually seen to be full and the lower half may be sunken. Characteristic peristaltic waves if not seen immediately, can usually be excited without difficulty. It is seen as a wave beginning just below the ribs on the left side which moves slowly to the right and disappears just beyond the mid-line. Vomiting frequently occurs after marked peristaltic movements. The hardened pyloric mass can in most cases be felt about two inches below the costal margin just inside the right mammary line although in long standing cases it may be displaced or obscured by distention of the stomach or enlargement of the liver or colon. The direction and course of peristaltic waves aid the examiner in finding it. It usually appears to be sausage shaped about 1 cm. in diameter and about 3 cm. long. It may be felt during active peristalsis only, and when it contracts actively under the examining finger its identity is unmistakable.

The prolonged retention of food in the stomach is one of the characteristic features of pyloric stenosis. In healthy nursing infants the stomach is almost invariably empty at the end of three hours. But if stenosis is present, food in considerable quantities is found at the end of three or even four hours if vomiting has not occurred. Gastric retention is best estimated by removal of stomach contents by means of a stomach tube with slight suction. In this way the rapidity with which the food leaves the stomach can be determined quite as accurately as by roentgen-ray examination following barium feeding.

Diagnosis

Diagnosis is usually easy after a few days' observation. The history is usually characteristic. The diagnostic features on examination are three: waves of gastric peristalsis, abnormal gastric retention and a palpable pyloric mass. Pyloric stenosis has been mistaken for: 1. *Cerebral disease* on account of the projectile vomiting and chronic constipation. 2. *Renal disease* because of the vomiting and scanty urine. 3. *Functional vomiting* in which the food expulsion is not projectile and other features of congenital stenosis are absent. 4. Vomiting associated with *parenteral infection* in which anorexia and other evidences of infection are present. 5. *Congenital obstruction of the duodenum* or other parts of small bowel may resemble pyloric stenosis especially if the lesion is in the proximal portions. In these cases the symptoms and signs appear shortly after birth and the vomitus contains bile and no pyloric tumour is felt.

Pathology

The pylorus appears in the gross as a hard whitish tumour of almost cartilagenous consistency about the size of the terminal phalanx of the little finger and projects into the duodenum. The thickening extends for a few centimeters along the pyloric canal and then gradually disappears although the stomach is frequently seen to be hypertrophied. The lumen may be so narrow as to barely admit a fine probe and frequently water cannot be forced through it due to the closely packed folds of mucous membrane protruding into it. The stomach is often seen to be dilated. Microscopically the thickening is seen to be chiefly of the circular muscle fibres, which are increased to two to three times the normal thickness of this layer. The other coats are thickened also but to a much lesser degree.

Prognosis

The course and prognosis of the malady depends on the severity of the condition. In the severe form, peristalsis and vomiting are little influenced by medical treatment; the loss of weight is continuous and often amounts to 2 or 3 ounces a day; there is very little fecal matter in the stools. Unless relieved by operation, the condition generally proves fatal in from two to four weeks although sometimes shortly before death there may be, owing apparently to extreme exhaustion of the child, complete relaxation of the spasm with cessation of vomiting and the passage of fecal stools. In the mild form the symptoms though characteristic are much less marked; gastric peristalsis and a palpable pyloric tumour are present but the vomiting may be only occasional, fecal stools are passed, the loss of weight is not so marked and there may be periods of improvement with gain in weight. Many of these patients recover without surgical aid, the symptoms gradually abating and the pyloric mass disappearing slowly.

Treatment

The treatment adopted will depend upon the type of case with which we deal. With all cases, medical treatment should be given a faithful trial. If the patient is seen early this may safely be carried out for a period of two weeks. In a large proportion of those classified as mild cases, medical treatment will be successful and they usually show decided improvement in a few days. If a case is seen when the symptoms have persisted for two to three weeks or longer, operation should be advised as the risk of waiting in these cases is greater than operation.

Medical treatment is carried out on the pylorus spasm theory and that the spasm will subside if nutrition is maintained. It consists of diet and stomach washing. Small meals at about 4 hour intervals are essential and weaning is not advisable if the mother has sufficient milk. For artificially fed infants, human milk often succeeds. If vomiting occurs, the child should be refed, the refeeding often being retained.

Atropine in full doses has been recommended to relieve the pylorospasm giving 1 drop per os of 1: 1000 dilution of atropine sulphate 10 minutes before feeding.

Lavage should be done three hours after a feeding and may be repeated twice in 24 hours. It empties the organ of food and mucous and seems to have some effect on allaying the spasm.

Many operations have been devised but the Fredet-Rhammstedt operation is now the accepted procedure. The circular muscle layer of the pylorus is divided externally without opening the mucosa of the stomach. After this is done the pylorus opens readily and food passes into the intestine. The operation can be done under local anaesthesia if desired. The operative risk in severe cases is considerably diminished by postponing interference long enough to overcome dehydration.

The after treatment is very important. Feeding may be begun as soon as the infant has recovered from the anaesthetic and the food should be human milk if possible. The patient should be started on 1-2 teaspoonfuls every three hours alternating with the same amount of water, the amount being gradually increased so that at the end of 48 hours the child is receiving one ounce of milk q. 4. h. and the same quantity of water between feedings. At the end of the week most cases can be put back on breast feeding, care being taken to limit the amount taken.

Parenteral administration of fluid is generally required for some days after operation and is best administered in the form of physiological saline.

THE PRE-CLINICAL PITUITARY

By F. L. LAWSON, '40

The pituitary gland is a little organ attached to the floor of the diencephalon. Despite its small size it has many functions, and is one of the most versatile and important structures in the body. It has a double origin, from buccal ectoderm and neural ectoderm.

Embryology

The *pars buccalis* arises as an evagination of the ectoderm of the primitive buccal cavity and extends as Rathke's craniopharyngeal pouch toward the embryonic brain. The posterior wall of this outgrowth comes into contact with a ventral evagination of the diencephalon, the former becoming the *pars intermedia*, the latter the *infundibular process of the pars nervosa*, and the two together forming the *posterior lobe* of the pituitary body. The rest of the pars buccalis divides into two lateral portions and a large anterior portion. The latter becomes the *pars distalis* (most distal from the brain) or *anterior lobe* of the pituitary body. Between anterior and posterior lobes the lumen of Rathke's pouch persists in young humans and many adult mammals as a narrow cleft, but in the adult it is represented by a layer of vesicles. The two lateral portions of the pars buccalis fuse in the midline to form the *pars tuberalis*. The pars buccalis in man normally becomes completely separated from the buccal ectoderm.

The *pars nervosa* develops from the floor of the diencephalon as an anterior *median eminence* (once thought to be part of the tuber cinereum) and a posterior funnel-shaped evagination, the *infundibulum*. The median eminence and infundibulum maintain throughout life an intimate association, both structurally and functionally, with the tuber cinereum. Distally the infundibulum expands into an *infundibular process*, to which the pars intermedia becomes adherent. The attachment of the infundibulum (now actually the *infundibular bulb*) to the infundibular process is drawn out, most markedly in primates, forming an *infundibular stem*. In the cat the cavity of the entire neural evagination (infundibulum) persists, retaining its connection with the third ventricle of the brain. In other mammals, including man, the cavity is obliterated in the infundibular process and stem, and persists only in the infundibular bulb. As development proceeds the pars tuberalis extends upwards to surround the infundibular stem and bulb, and to apply itself to the lower surface of the median eminence.

Anatomy and Histology

The *pituitary gland* may, therefore, be considered to consist of a pituitary stalk and a pituitary body. The *pituitary stalk* includes the median eminence, the bulb and the stem of the infundibulum (all parts of the pars nervosa), and the pars tuberalis which is applied to them. It is invested with pia mater, and extends through the subarachnoid space to the pituitary body. The *pituitary body* has two lobes, separated by a cleft or some vesicles: a posterior, formed by the infundibular process of the pars nervosa and the adherent pars intermedia, and an anterior, the pars distalis. In lower animals, in which the gland is backwardly inclined from its attachment to the brain, the anterior lobe more or less completely surrounds the posterior. In man the gland is not inclined backwards and the posterior lobe is covered only in front by the broad anterior lobe. The pituitary body in man measures on the average about 5 by 10 by 15 mm., and weighs about 0.6 gram, but it becomes larger in pregnant women. It is located in the sella turcica of the sphenoid bone, and, except at its point of continuity with the pituitary stalk, is enclosed by a sheath of dura mater.

The *pars distalis* or *anterior lobe* constitutes about three-quarters of the pituitary body. It consists of groups

and columns of cells supported by reticular connective tissue. Between the columns are sinusoids lined by macrophages. Occasionally acinus-like structures with colloid are present. About half (52 per cent) of the epithelial cells are chromophobe, and half are chromophil. The chromophil cells are of two types, acidophil and basophil. The *acidophils* make up about 37 per cent of the cells and are most numerous in the central and anterior portions of the pars distalis. The *basophils*, constituting about 11 per cent of the cells, are the larger, but the acidophils contain larger and more numerous granules. In both types the granules are believed to give rise to the secretions, growth factor in the case of the acidophils, and gonadotropic factors in the case of the basophils. The *chromophobes* are most numerous near the pituitary stalk. They are believed to be reserve cells, from which the chromophils can develop. The nuclei of all three types are similar, and are usually vesicular in appearance. The increase in size of the pituitary body during pregnancy is due to an increase in the number of chromophobe cells.

The *pars tuberalis* extends upwards from the pars distalis to form the outer surface of the pituitary stalk. It constitutes about one-fiftieth of the pituitary gland in adult man. It also contains rows of cells separated by sinusoids. The cells, however, have no granules, and are chromophobic in character. Frequently they form cavities containing a colloid material. Scattered nests of squamous epithelial (buccal) cells are occasionally present.

The *pars intermedia* is small and indefinite in man, constituting less than one-hundredth of the pituitary body. It is applied to the infundibular process of the pars nervosa, and in adult man is separated from the pars distalis only by a number of vesicles, the remnants of Rathke's pouch. Certain follicular structures, formed of non-granular cells and filled with a colloid material may also be similar remnants. In youth, small glands derived from the pars intermedia but lodged in the infundibular process open into the follicles or vesicles. The pars intermedia is composed of a few layers of granular basophil cells, which resemble and merge with those of the pars distalis. A few chromophobes are also present. Characteristically columns of basophil cells penetrate into the infundibular process, sometimes for considerable distances, so rendering difficult a precise analysis of the functions of the parts of the posterior lobe. The pars intermedia is the most variable part of the pituitary gland, and is absent from certain aquatic mammals such as the whale.

The *pars nervosa* develops from the brain. It includes the median eminence, the infundibular bulb, the infundibular stem, and the infundibular process. The latter constitutes about one-quarter of the pituitary body, and the whole pars nervosa about two-fifths of the pituitary gland. In man it is composed largely of polymorphous cells with delicate processes and tiny granules and droplets. These cells are known as *pituicytes*, and are of ependymal origin. In the pars nervosa are also undifferentiated cells from which the pituicytes develop, neuroglial cells, nerve fibres, and connected with the latter hyaline bodies of uncertain function. Columns of granular basophil epithelial cells penetrate from the pars intermedia into the infundibular process.

The vascular relations of the pituitary gland are peculiar. The pars distalis and the pituitary stalk are very vascular. Both have a systemic blood supply from the superior pituitary arteries. The blood from the pituitary stalk (the median eminence, the infundibular bulb and stem, and the pars tuberalis) drains by portal venules on the surface of the stalk into the sinusoids of the pars distalis, which therefore has both a systemic and a portal blood supply like the liver. The pars distalis alone of the two has a systemic blood drainage, into the cavernous sinus. The infundibular process is less vascular, and the pars intermedia much less so. Both of these have a systemic blood supply from the inferior pituitary arteries and a systemic blood drainage into the cavernous sinus.

The best evidence indicates that under physiological conditions the only significant pathway of secretion of all the

parts of the pituitary gland is into the blood stream.

The entire pars nervosa, to a smaller extent the pars intermedia, probably the the pars tuberalis, and possibly the pars distalis are innervated by nerve fibres which pass down the pituitary stalk from the supraoptic, tuberal, and other nuclei of the tuber cinereum. The fibres to the pars nervosa, just as the fibres to the adrenal medulla, are necessary to the proper functioning of that organ. Sympathetic fibres of the autonomic system constitute the chief nerve supply of the pars distalis, and are derived from the superior cervical ganglion through the carotid plexus. Probably some sympathetic fibres pass also to the pars intermedia and the pars tuberalis.

Physiology

The *pars distalis* (the anterior lobe) elaborates and secretes several different hormones. These singly or in combination form the principles or factors necessary for numerous metabolic effects. It is probable that every effect has not its own individual causative factor, since certain groups of effects appear to have factors in common.

1. *Growth or somatotropic factor* is produced by the acidophil cells. Due to tumours of these cells giantism (a result of overgrowth of the long bones) occurs in children, and acromegaly in adults. Dwarfism is due to insufficient growth factor, and may result from congenital underdevelopment of acidophils. Removal of the pituitary causes a cessation of growth and injections of growth factor will promote growth once more.

2. *Thyrotropic factor* causes growth and secretion of the thyroid gland. After removal of the pituitary the thyroid undergoes atrophy, but is restored by administration of this factor. However, following prolonged administration, an antithyrotropic substance is produced in the body, rendering it resistant to the thyrotropic factor.

3. *Adrenalotropic factor*, on injection, causes hypertrophy of the zona glomerulosa and zona fasciculata of the adrenal cortex, whereas removal of the pituitary gland causes atrophy. By their action on the adrenal cortex and spleen, secretions of the pars distalis increase the resistance of the body to poisons and infections.

4. One *gonadotropic factor*, the *follicle-stimulating hormone*, promotes maturation of ovarian follicles or spermatogenesis, depending on the sex of the individual.

5. The other *gonadotropic factor*, the *luteinizing hormone*, causes luteinization of the ruptured follicle or stimulates the interstitial cells of the testis, as the sex may be. Possibly these effects are produced by separate fractions. Since the sex cycle is somewhat different in the various species, these factors have not quite the same effect in all animals. Formation of the gonadotropic factors is depressed by injections (and probably by physiological increase) of sex hormones (in the female respectively estrone and progesterone, in the male testosterone), and castration causes storage of the factors. The gonadotropic factors are produced by the basophil cells, which increase in number following castration. Following prolonged administration of gonadotropic factors an antigonadotropic substance is produced in the body.

6. *Lactogenic factor* initiates and maintains lactation after the mammary glands have been prepared for secretion by estrone and progesterone. Removal of the pituitary results in cessation of lactation and involution of the mammary glands in lactating females. This factor also stimulates the development of the crop-gland in the pigeon.

7. *Parathyrotropic factor* is a possible entity, since pituitary extracts have been reported to cause hypertrophy, and removal of the pituitary to cause atrophy of the parathyroid glands.

8. *Pancreatotropic factor* causes an increased secretion of insulin, and is said to promote an increase in the number and size of the pancreatic islets of Langerhans.

9. *Diabetogenic factor* causes a state quite comparable to pancreatic diabetes mellitus, in which there is hyperglycemia, glycosuria, ketosis and increased nitrogen excretion. This action is probably enhanced by the factor with contra-insulin activity. Following removal of

the pituitary (or damage to the tuber cinereum) the blood sugar falls, and simultaneous or subsequent removal of the pancreas does not result in diabetes mellitus. Even the temporary administration of diabetogenic factor will cause a permanent diabetes mellitus in the presence of a normally adequate supply of insulin.

10. *Lipotropic factor* or factors cause an increase in liver fat, and a decrease in blood lipoids.

11. *Ketogenic factor* stimulates the production and excretion of acetone (ketone) bodies, but prolonged administration causes a refractory state. It is active only in the presence of an adrenal cortical hormone. It is probably identical with the specific metabolic factor.

12. *Specific metabolic factor*, present in pars distalis extracts, causes an increase in metabolism in the thyroidectomized animal. It is believed to be responsible not only for increased metabolism but also for ketogenesis and the following additional effects:

13. Antagonism to insulin (contra-insulin effect),

14. Inhibition of adrenalin hyperglycemia,

15. Retention and increase of carbohydrate stores (glycostatic and glycotropic effects),

16. Lowering of respiratory quotient with sharp rise in oxygen consumption in normal animals,

17. Expansion of melanophores in the frog and of erythrophores in the minnow.

Since the latter effect is due to secretion of the pars intermedia, specific metabolic factor must be elaborated in this part of the pituitary gland, except in such animals as the whale.

Little is known of the secretions of the *pars tuberalis*, but possibly it elaborates an antidiuretic factor.

The only hormone definitely derived from the *pars intermedia* is the chromatophore-expanding factor *intermedin* (apparently the specific metabolic factor of pars distalis extracts), which causes expansion of the melanophores in the skin of the frog and of the erythrophores in the skin of the minnow. In whales, which have no pars intermedia, this hormone is produced in the pars distalis. To the pars intermedia has been attributed also an antidiuretic factor, but this is of doubtful existence.

The secretions or hormones of the *pars nervosa* are produced under nervous control like those of the adrenal medulla, and also like the latter their effects are dramatic but fleeting.

1. *Hypertensive factor*, or vasopressin, stimulates smooth muscle generally. By its action on the smooth muscle of arterioles it causes a rise in blood pressure. It is also markedly *antidiuretic*, since by acting on the kidney it prevents the secretion of an excessive amount of urine. Possibly the antidiuretic factors obtained from the pars tuberalis and the pars intermedia are contaminants from the pars nervosa.

2. *Oxytocic factor*, or oxytocin, causes the smooth muscle of the uterus to contract, and raises the blood sugar. Vasopressin, oxytocin, and extracts of the posterior lobe of the pituitary gland containing the two of them, are potent in extreme dilution.

As a result of total destruction of the supraoptic nuclei of the tuber cinereum, of the supraoptico-pituitary tracts of nerve fibres, or of the pars nervosa to which they run, there ensues a condition known as diabetes insipidus. This is characterized by polyuria, polydipsia, hyperchloremia and hypochloruria, and is permanent only in the presence of some persistent anterior lobe tissue. It is believed to be due to deficient reabsorption of water by the nephric tubules of the kidneys. Treatment with the antidiuretic factor (vasopressin) or whole posterior lobe extract alleviates the condition.

It is apparent that the pars distalis and the pars intermedia are of fundamental importance in the regulation of protein, fat and carbohydrate metabolism, and that the pars nervosa is necessary to the normal regulation of water balance. Although not essential to life itself, the pituitary gland is the principle endocrine mechanism for the maintenance of homeostasis.

A LUMP IN THE NECK—DIFFERENTIAL DIAGNOSIS

By JOHN W. SCOTT, M.A., '41

The accurate interpretation of a lump in the neck is a problem that requires considerable care and thought. Although the lesion appears to be well localized, a complete history and physical examination should not be neglected.

History

The history of the local lesion should be obtained in as much detail as possible. Determine when the lump appeared and what drew the patient's attention to it. This may be difficult in cases where the swelling had a gradual onset and errors are apt to arise when trauma has directed the patient's attention to a pre-existing swelling.

It is important to know the exact region in which the lump appeared, for if it is of considerable size when the patient seeks medical aid this may be difficult to determine by means of physical examination. The history should also describe the progress of the lesion, for this will be helpful in determining its nature. Care must be exercised, for an acute inflammatory process may mask the presence of a chronic condition, which may not have been noticed before.

Physical Examination

The two points to be determined by the physical examination are the nature of the lump and the structure in which it developed. In order that no details may be missed, the usual routine of inspection, palpation, percussion and auscultation should be followed.

Inspection. The position of the swelling should be observed and its size and shape noted. Attention should be given to the skin, for it may be normal, inflamed, adherent or stretched tightly over the swelling. Any movements of the lesion should be noted and the effect of voluntary movements observed. Pulsations may be present and the regional arteries and veins may be dilated. Finally, the swelling should be watched for changes in size or shape during swallowing and the various phases of respiration.

Palpation. The first point to observe while palpating a swelling is the skin temperature, before it has been altered by the examiner's fingers. Previous observations of size, shape and position should be confirmed and the plane or structure in which the lesion lies should be determined. Some help is afforded in this localization by determining the mobility of the lump in relation to the surrounding organs during both passive and active movement. At the same time the attachments of the tumour can be ascertained.

Early in the examination the pain or tenderness of the lesion will have been assessed, and the other features of the lesion should now be determined. A tumour mass may be solid or cystic, simple or lobulated, discreet or infiltrating and its surface smooth or rough. If solid, the hardness should be estimated and any nodules present palpated. If it is cystic, it should be gently compressed, to determine whether the contents can be expressed, and if so, whether they return spontaneously or whether distension depends upon respiration or deglutition.

Percussion is of value in distinguishing a pneumonocele from other swellings at the root of the neck.

Auscultation. Many tumours of blood vessels or vascular tumours present marked bruits.

Transillumination is often helpful in differentiating cysts and solid tumours.

Differential Diagnosis

When the nature and characters of a lesion have been determined and the number of possible structures involved reduced to a minimum, the pathological conditions that could cause it should be considered systematically, following a scheme of this type.

I. Congenital lesions
  (*a*) Structures that normally disappear.
  (*b*) Duplication of normal structures.
  (*c*) Abnormal development of normal structures.
II. Inflammatory lesions
  (*a*) Traumatic.
  (*b*) Infectious—Acute.
    Chronic.
III. Neoplasms
  (*a*) Benign.
  (*b*) Malignant—Primary.
    Secondary.
IV. Metabolic and degenerative lesions
V. Miscellaneous

Congenital Lesions

Structures that normally disappear

The branchial clefts normally are closed early in foetal life but one or more may remain patent producing either a fistula, sinus or cyst depending upon the amount of the cleft that persists. Usually it is the third cleft that fails to close. If it remains as a fistula, its track leads from the tonsillar region of the pharynx between the external and internal carotid arteries to open on the skin surface near the anterior border of the sterno-mastoid muscle, just above the jugular notch. The sinus secretes a thin mucoid fluid so it is frequently difficult to distinguish between a fistula and a sinus unless the track is filled with barium and examined by x-ray.

If a portion from the centre of the track is isolated a cyst will result. Although these cysts are congenital in origin, they frequently are not observed till adolescence. They gradually increase in size, forming soft, painless fluctuant masses usually about the level of the hyoid bone. These cysts do not appear to be attached to either the skin or the deeper structures, and their walls contain no solid material.

A persisting portion of the thyroglossal duct gives rise to a small spherical, transluscent, fluctuant mass lying near the midline. These cysts are not attached to the skin but are frequently adherent to the hyoid bone and move with the latter during swallowing. They are painless as a rule but are liable to attacks of inflammation or suppuration.

Duplication of Normal Structures

Accessory thyroids may develop anywhere along the course of the thyroglossal duct. They occur in the midline as soft solid masses, which are liable to the same disturbances as the thyroid itself.

Cervical rib is a congenital anomaly that is of importance because of the muscular atrophy it causes in the arm rather than the local symptoms in the neck. However the presence of a cervical rib must not be forgotten when palpating the root of the neck, for it may never cause any symptoms and rarely does before the age of puberty.

Accessory auricles are not uncommon, forming small protuberances down the side of the neck, usually along the side of the sterno-mastoid muscle. They are firm to the touch for they consist of small pieces of cartilage covered with skin.

Abnormal development of normal structures

Cystic hygroma is usually seen in children, and forms a large soft swelling commonly at the root of the neck. It causes no symptoms unless it is large enough to press upon important structures. The skin over the swelling is frequently bluish and the tissues above tend to be oedematous. The swelling is transluscent and loculated since it is composed of dilated lymphatics.

Dermoid cysts occur not infrequently along the lines of embryonic fissures and therefore in the neck are found along the mid-line and in relation to the branchial clefts. They are of congenital origin but frequently pass unnoticed for years. They form circumscribed, well encapsulated swellings, which are tense and adherent to deep structures, but not to the skin. These cysts vary from the size of a pea to the size of a walnut.

A cavernous haemangioma causes a painless swelling over which the skin may have a purplish red tinge. It is painless and soft to the touch and can be collapsed by gentle pressure but rapidly refills. The mass may be either diffuse or well circumscribed. There is usually no pulsation or bruit, but both

may be present if there is a predominence of the arterial elements.

Spina bifida causes a swelling in the mid-line posteriorly. It is unusual for it to occur in the cervical region, but is easily recognized. It causes a cystic swelling that can be compressed and gives an impulse on coughing. Sometimes the separated spines can be palpated.

Inflammatory Lesions

In the neck inflammation is usually caused by trauma, infection or neoplasm, and the classical signs—pain, swelling, heat and redness—identify it.

Traumatic lesions

A lump produced by trauma may be due to a fracture, haemorrhage or oedema. These may occur singly or in any combination, frequently all three being present. They can usually be diagnosed from the history, for the deformity of a fracture occurs at the time of the injury, the haemorrhagic swelling occurs rapidly and the oedema develops gradually. On physical examination a fracture can be recognized by the usual signs and symptoms. The differentiation between a subcutaneous haemorrhage and oedema is difficult, since both cause a soft baggy swelling unless a fluctuant haematoma is formed.

Infections

The non-specific infections of the neck are similar to those found in other parts of the body. The back of the neck is very prone to boils. Spreading cellulitis is not uncommon, and if the submandibular region is affected it is known as Ludwig's angina. A retropharyngeal abscess causes a soft fluctuant swelling of the posterior wall of the pharynx that tracks to the surface behind the sternomastoid muscle. All these lesions usually start acutely but tend to become chronic.

Cervical lymphadenitis is a usual accompaniment of any infection of the region drained by these glands. The glands are enlarged and tender and soon become fixed and adherent to each other. The condition usually subsides rapidly after the primary focus has been cured. The possibility of tuberculous or syphilitic infection must be considered in those cases that have no evident primary lesion.

Mumps may involve any of the salivary glands, which become much enlarged, but there is very little pain except when the jaw is moved. The skin over the swelling is tense but not inflamed.

Anthrax causes a reddish papule surrounded by a blanched area of skin. There is usually an inner indurated zone with an area of oedema several inches in diameter surrounding the pustule.

A tuberculous lymph gland enlarges but at first remains freely moveable and relatively painless. At about the time caseation commences a periadenitis occurs and the gland becomes adherent to the surrounding structures.

A cold abscess associated with tuberculosis of the spine usually forms a chronic retropharyngeal abscess, which may open into the pharynx, posterior triangle or track downwards into the mediastinum. It can usually be felt in the mouth through the posterior pharyngeal wall as a soft fluctuant mass.

Each of the three stages of syphilis causes a characteristic lesion in the neck. The primary sore is frequently near the mouth so that the cervical lymph glands are involved in the first stage. They become hard, like nodules of cartilage, but are freely moveable under the skin and usually painless. The lymph nodes do not suppurate in the first stage unless the primary sore becomes secondarily infected. During the second stage there is a general lymphatic involvement, so that all the cervical glands become hard round swellings beneath the skin. During the tertiary stage gummata may occur either in the skin or subcutaneously. In the skin a dusky red nodule is formed which is usually painless and has a firm consistency. Suppuration frequently ensues with the formation of a characteristic syphilitic ulcer. A subcutaneous gumma forms an elastic or fluctuant mass which gradually increases in size and is accompanied by a little pain and tenderness. The overlying skin may become dusky and oedematous.

Actinomycosis causes a firm smooth

swelling that gradually merges into the surrounding tissues. The lesion usually occurs near the angle of the jaw and the lymph nodes are not involved. Suppuration ensues and a sinus is formed that discharges pus containing sulphur granules.

Neoplasms

Benign tumours form well defined encapsulated masses that are not adherent to surrounding tissues and do not cause inflammation of the overlying skin. Malignant tumours are not well defined, grow rapidly and soon become adherent to both skin and deep structures and usually cause considerable pain and inflammation of the surrounding tissues. Malignant tumours tend to be harder than benign tumours, yet fluctuation is frequently produced in the former by necrosis of the centre and ulceration is commonly seen in the later stages.

In the neck the majority of solid tumours are related to the lymph glands and thyroid, yet a tumour of any tissue may occur in the neck.

In the neck the majority of the malignant tumours are metastases, mostly from primary neoplasms in or about the mouth and pharynx. It must be remembered that the glands in the root of the neck may show metastases from malignant growths in the stomach or thorax. Any tissue in the neck may give rise to a malignant growth as in other parts of the body, yet there are a few tumours that must be specially remembered in this region.

A malignant tumour of the carotid body gives rise to a stony hard mass under the upper third of the sternomastoid. It is intimately attached to all three carotid vessels, so frequently a transmitted pulsation is present and the tumour will move transversely, but not vertically. At first the tumour is painless but bizarre nerve symptoms are produced by the involvement of adjacent nerves.

A remnant of a branchial cleft or the thyroglossal duct may give rise to a malignant tumour, causing a primary growth in an unexpected region.

Lymphosarcoma is a rapidly growing tumour which at first forms firm elastic painless enlargements of the lymph nodes, but rapidly infiltrates the surrounding structures, producing diffuse ill-defined tumours that cause pain by involvement of nerve trunks. Secondary growths occur very early. The overlying skin becomes congested and in the later stages ulcerates.

Hodgkin's Disease at first causes a soft elastic enlargement of the lymph glands which remain discreet. Gradually all the lymphoid tissue of the body is involved, and in the later stages periadenitis occurs and great masses of adherent glands are formed. Tuberculosis can be distinguished from Hodgkin's Disease because the former tends to cause early suppuration and adhesions, but the differentiation is often difficult without a biopsy.

Lymphatic leukaemia causes a similar condition to Hodgkin's Disease, but can be recognized by the leukaemia.

Metabolic and Degenerative Lesions

The majority of metabolic disturbances in the neck are associated with the thyroid. A colloid goitre causes a soft, elastic, general enlargement of the gland which is painless and may present lobulations. The enlargement may cause dysphagia or dyspnoea due to pressure, and the gland moves with the trachea during deglutition.

In the adenomatous goitre firm encapsulated nodules are present in a somewhat enlarged thyroid. The nodules can be moved freely within the substance of the gland, but this may be hard to demonstrate if they are deeply placed.

The thyroid in Graves disease is usually a little enlarged and frequently pulsates, but the diagnosis rests not on the local findings but on the general systemic symptoms.

Riedel's struma causes a slight enlargement of the thyroid which becomes stony hard and rough. It grips the trachea tightly so that a stridor is produced.

The thyroid may undergo an amyloid degeneration in which case it is somewhat enlarged and rather rubbery.

There is normally an atrophy of the thymus after the age of two years, but occasionally this involution does not

occur, and there is a fullness of the root of the neck. This is accompanied by a mass in the mediastinum which causes an area of dullness, and presses on the great veins and trachea.

The lipomatoses form a group of conditions whose etiology is not understood. The deposits of fat may occur as circumscribed nodules either singly or in groups, or a large collar may be formed by a general infiltration of the subcutaneous tissues. There is also a group of cases in which the fat deposits are associated with pain, either spontaneous or produced by slight pressure which have been separated under the name of Adiposa Dolorosa. This condition is usually accompanied by general obesity.

Miscellaneous

This group is added to act as a "waste paper basket" in which are placed those conditions which cannot be classified elsewhere. Consequently the lesions in this group have no rational relationship.

A mass of scar tissue appears as a firm elastic lump, which has a history of trauma or inflammation. Congenital induration of the sterno-mastoid results from a birth injury and causes a wry neck.

An arteriovenous aneurysm produces a pulsating swelling, which also presents a thrill and bruit. The surrounding veins are dilated and pulsate. There is usually an enlargement of the heart and a low diastolic pressure.

Sebaceous cysts form painless rounded fluctuant or doughy swellings of variable size that are attached to the skin, but freely moveable over the underlying structures. They grow slowly, and usually a small black speck at the top of the swelling represents the occluded duct.

The sub-hyoid bursa may become distended with fluid, forming a tense painless fluctuant mass that is not attached to the skin but moves with the larynx.

The lung may herniate through Sibson's fascia, forming a pneumatocele which appears as a highly resonant collapsible soft swelling at the root of the neck that shows a marked impulse on coughing.

A pharyngeal diverticulum or an aerocele, which is a dilatation of the sacculus of the larynx, produces a reducible resonant swelling in the region of the cricoid cartilage that gives an impulse on coughing.

Pages from the Past

ON CONFLICTING OPINIONS:

"To the Medical Student, into whose hands this Essay may fall, some words of introduction may be appropriate, and perhaps to a small number of them, necessary. There are some among them, who, from youth, or want of training, are easily bewildered and confused in any conflict of opinions into which their studies lead them. They are liable to lose sight of the main question in collateral issues, and to be run away with by suggestive speculations. They confound belief with evidence, often trusting the first because it is expressed with energy, and slighting the later because it is calm and unimpassioned. They are not satisfied with proof; they cannot believe a point is settled so long as everybody is not silenced. They have not learned that error is got out of the minds that cherish it, as the taenia is removed from the body, one joint, or a few joints at a time, for the most part, rarely the whole evil at once. They naturally have faith in their instructors, turning to them for truth, and taking what they may choose to give them; babes in knowledge not yet able to tell the breast from the bottle, pumping away for the milk of truth at all that offers, were it nothing better than a Professor's shrivelled forefinger."

The Contagiousness of Puerperal Fever,

OLIVER WENDELL HOLMES,
Medical Essays (1842-1882),
—(The Riverside Press, Cambridge).

THE CLINICAL SIGNIFICANCE OF DYSPNOEA

By W. E. ARMOUR, '41

The subject of dyspnoea is of clinical interest, and a great deal has been written on it. It is the purpose of this article to summarize the more important literature for the benefit of those who are commencing clinical work.

One of the most striking signs of disease to a student commencing ward work, is the sight of a patient propped up in bed, gasping loudly for breath through an open mouth which adds to the strained expression of his face. The condition is called *Dyspnoea*, a word meaning difficulty in breathing. The definition most widely accepted is that of Meakins: *A consciousness of the necessity for increased respiratory effort.*

A brief survey of the physiological control of the breathing will be in order, to place the pathological mechanisms by which it is deranged.

Physiology of Breathing

The factors ultimately responsible for the control of respiration are two, namely, *chemical* and *reflex*; the former, generally speaking, controls it quantitatively, the latter qualitatively.

Directly, the breathing is under control of a *respiratory centre* situated in the reticular formation of the medulla, which influences the skeletal muscles of respiration via spinal nerves—the phrenics and intercostals. This centre possesses an inherent rhythmicity, which is modified by a large number of factors, divided, as above, into those of a chemical and those of a nervous nature.

The *chemical state of the blood* has both a direct effect upon the centre, and a reflex one via afferents from the chemoceptors of the carotid and aortic bodies. The direct effects are: excess CO_2 and, to a minor extent, oxygen lack producing stimulation. Severe oxygen lack produces depression. (The effect of oxygen lack is controversial, and will be discussed subsequently.) Increased hydrogen ion concentration has a stimulating effect, which is probably due to the displacement of carbon dioxide from base. The effect upon the carotid and aortic bodies is similar, but here oxygen lack apparently has a definite stimulating effect. The reaction or CO_2 content of the blood also has a modifying effect upon the reflexes, tending generally to increase their sensitivity.

Reflexly, in addition to the chemical, aortic and carotid reflexes mentioned above, the action of *blood pressure* on them influences the respiratory rhythm; a rise tends to depress it, a fall to stimulate it. In addition, the cerebral blood pressure acts through its effect on the blood supply to the brain.

The lungs, bronchi and trachea contain stretch receptors, and impulses from these pass to the medulla via the vagus, constituting the *Hering-Breuer reflex.* This tends to act as a check-rein on the depth of a breath; impulses arriving during a phase of inspiration tend to shorten it, the result being to make the respiration shallower and more rapid. Proprioceptive impulses from the diaphragm and intercostal muscles act in a somewhat similar manner. In addition, strong stimulation of the sensorium tends to deepen respiration.

The *temperature of the blood* acts directly on the respiratory centre, a rise leading to increased activity.

In summary, then, one may say that factors influencing respiration are those which it helps to control: the temperature of the blood, gaseous exchange, acid-base balance, and, perhaps most important of all, the oxygen supply to the brain.

Dyspnoea may thus occur in a variety of ways, through the action or perversion of any of these mechanisms. It must be remembered that one particular factor is rarely solely responsible.

Breathing may be deepened four or five-fold before it obtrudes itself upon the person's attention. It may also become too shallow and inefficient to supply the needs of the body, and must then be supplemented by voluntary effort. In either case, the result is dyspnoea.

Causes of Dyspnoea

A convenient division of the clinical causes might be those in which the efficient aeration of the blood is reduced below the needs of the individual, and those in which the needs are increased beyond the present ventilation. Naturally in practice the two overlap, and the division is arbitrary, but convenient.

A. Deficit in Aeration of the Blood

Decreased Vital Capacity:

The average figures for the volume of air in the lungs are:

Tidal air	500 ccs.
Reserve air	1000 ccs.
Complementary air	2000 ccs.
Vital capacity	3500 ccs.

The vital capacity, then, is normally seven times that of the tidal air; when the two approach one another, by increase of one or diminution of the other, dyspnoea results.

Vital capacity is reduced:

(*a*) By reduction of the intrapleural space, e.g., by pleural effusion, tumour, or pneumothorax.

(*b*) By limitation of the respiratory movements, e.g., paralysis, ascites, subphrenic abscess, and pleurisy (because of painful breathing).

(*c*) In pneumonia, chronic passive congestion and other lung conditions. It is now thought, however, that in these, the reflex factor is more important than the mechanical effect of oedema and reduced elasticity. Pneumonia, indeed, tends to produce dyspnoea in nearly every way possible through the above effects, that of the action of the toxin upon the respiratory centre, the increased metabolism of fever and impaired pulmonary circulation. Emphysema acts by reducing the amount of movement possible, as the lungs are at rest in what would normally be the inspiratory position. In addition, there is poor pulmonary circulation, less alveolar area for gaseous exchange, and the respiratory centre is less sensitive to CO_2.

Obstruction:

This is obvious. Three common ways in which it may occur are asthma, bronchogenic carcinoma, and a mucous plug. Diphtheritic membranes and laryngeal spasm are sometimes responsible.

Poor Exchange of Gas Between Blood and Alveolar Air:

This may be caused by oedema of the lung if widespread enough; emphysema has also been mentioned. It has been suggested that one of the factors in athletic training is alteration of the capillary permeability, so that gaseous exchange may take place more rapidly.

The causes given above have mostly to do with anoxic anoxaemia. Dyspnoea is also present in severe anaemia. Stagnant anoxaemia has been mentioned, with respect to impaired pulmonary circulation. In heart disease, it is only one of the factors present; the others are: increased cardiac effort, pulmonary engorgement, and a reflex initiated by increased venous pressure in the right atrium which stimulates the respiratory centre. The result is marked dyspnoea of a paroxysmal nature, known as "cardiac asthma". Secondary renal involvement may also be present, which will aggravate the condition.

B. Increased Demand for Ventilation

These causes may be divided as follows: first, a real demand for "more air", due to increased metabolism; secondly, abnormal chemical conditions, notably with respect to the acid-base balance; thirdly, nervous impulses from higher centres.

Increased Metabolism:

The chief cause for this is exertion, which may indicate a pathological condition if only slight exercise produces dyspnoea. Patients with hyperthyroidism are often subject to dyspnoea; as usual, however, the increased metabolic rate is only part of the story. In addition, the vital capacity and mechanical efficiency of the breathing are decreased, muscular and cardiac efficiency suffer,

while the resting pulmonary ventilation may be twice the normal; the breathing tends to be rapid and shallow.

Severe fevers may be contributory to the development of dyspnoea, by increasing fuel combustion.

Chemical Disturbances:

These are either toxic in origin or due to acidosis.

When kidney function is impaired, there is retention of non-volatile acids sufficient to precipitate dyspnoea. In diabetes it may occur, due not so much to acidosis as to the specific action of the enolic form of aceto-acetic acid which acts directly on the respiratory centre. The effect is to produce an even, slow deep type of breathing known as "Kussmaul Breathing". When it is increased to the dyspnoeic point, coma is usually imminent.

Dyspnoea occurs in uraemia, even without marked acidosis, presumably due to the retention of some toxic substance. Other toxins causing it may be due to infections, etc.

Nervous Causes:

Factors which act locally and/or directly upon the respiratory centre have been in part discussed in the last paragraph. In addition to those substances acting from the blood, there are the stimulating drugs, such as caffeine and coramine. These, however, are unlikely causes, except in cases due to poisoning.

Increased intracranial pressure is commonly associated with dyspnoea, probably through its effect upon the blood supply, though the centre itself may be stimulated by pressure. In meningitis, local irritation is often followed by deepened breathing.

Lesions in the brain stem may cause dyspnoea either by irritation, or by interruption of paths from the higher centres, the highest of which is in the hypothalamus. The higher centres control those lower down, and release from their influence allows those below to assume a different type of breathing. The lesions mentioned may be vascular, encephalitic or neoplastic.

Hysteria, which delights in simulating organic disease, and the anxiety neuroses are causes arising in cortical centres. The hysterical type is markedly subjective, while the neurotic is characteristically irregular.

The respiratory centre may be depressed during sleep, leading to a feeling of weight on the chest, and temporary dyspnoea. Combined with other conditions, severe attacks may be precipitated; this often happens in cardiac asthma.

Reflex Causes:

The Hering-Breuer reflex has been mentioned. It may readily be seen that irritation of the vagal afferent endings, not only in the lung, but (since the tenth nerve lacks discrimination in these matters) other parts of its distribution, such as the larynx, may lead to hypersensitivity and overactivity of the mechanism. Within the lung, pulmonary embolism or thrombosis, atelectasis (leading to undue stretching of adjacent parts of the lung) and other irritating conditions will enhance the reflex, causing a tendency to rapid, shallow breathing.

The dyspnoea of pulmonary congestion is attributed by some to reflex causes. Here, the irritating factors are stiffness and reduced elasticity of the lung tissue, and increased capillary pressure. While it is doubtful if this is the sole cause, it is undoubtedly important; especially as in most cases the engorgement does not involve enough of the lung to interfere seriously with the aeration of the blood. Local peripheral irritation tends to increase the depth of breathing. There is thought to be a reflex initiated by receptors in the limbs and voluntary muscles during exercise; and the effect of sudden chilling of the skin is well known.

Types of Dyspnoea

The *Kussmaul breathing* of diabetes mellitus, and the *nocturnal paroxysmal dyspnoea* of cardiac asthma have been mentioned, as has also the irregular breathing of the neurotic. In asthma, the condition is characterized by wheez-

ing, in pulmonary oedema, sometimes, by a "rattle". Laryngeal spasm, as in tetany, produces a crowing sound.

Cheyne-Stokes breathing is usually a serious sign. It consists of a cycle, apnoea following dyspnoea, with a frequency that varies greatly. The patient may, for a few minutes, be struggling for air; then breathing stops until one would imagine him dying of suffocation, until suddenly he begins gasping again, with increasing vigour. Probably the cause is that anoxaemia leads to over-breathing until a CO_2 deficit is created, which depresses the respiratory centre until more carbon dioxide accumulates (this is certainly the cause of the type seen after voluntary over-breathing). It occurs most commonly in terminal degenerative heart disease, renal disease, increased intracranial pressure, pneumonia, and morphine poisoning.

The patient who is having difficulty with his breathing is rarely comfortable when lying recumbent, but prefers to be propped up, even sleeping in a chair. He is then said to be in the position of *orthopnoea* (straight or right breathing). The advantages of this are three—

(i) It "hangs a load" on his diaphragm, helping inspiration.

(ii) It allows the accessory muscles of respiration, such as the scaleni, more play.

(iii) In the case of pulmonary congestion, it allows freer flow of blood.

Summary

The physiological control of breathing has been briefly outlined, and it has been mentioned that no one factor is ever responsible for the development of dyspnoea. The control is of a chemical and a reflex nature.

Dyspnoea is produced:

(A) *By Deficient Aeration:* This may result from reduced vital capacity, obstruction and reduced epithelial permeability.
Anoxaemia probably causes dyspnoea by allowing the accumulation of acid metabolites.

(B) *By Increased Demand for Ventilation*, from metabolic, chemical, or nervous causes. Exertion and hyperthyroidism are the commonest factors in the first; uraemia, diabetes, infection and poisoning in the second, and hysteria, enhanced reflexes, and cerebral lesions in the third.

REFERENCES

R. V. Christie, *Quart J. Med., 7: 421-454, July '38.*

H. K. Detweiler, *Bull. Acad. Med., Toronto, 11: 262-267, July '38.*

Taylor and Best, *Physiological Basis of Medical Practice.*

Samson Wright, *Applied Physiology.*

Cabot and Adams, *Physical Diagnosis.*

Pages from the Past

ON MEDICINES:

"Another thing which prevents some practitioners from knowing the futility of their own prescriptions, and what nature left to herself can do, is, that they never leave Nature to herself. The instant they are called, they fall to work with their draughts, jullps, and apozems, and preserve with unrelenting assiduity till the disease terminates one way or the other; if the patient recovers, the medicines get the credit; if he dies, the disease is thought to have been incurable."

* * *

"It will be said that the powers of those medicines, which are found most effectual in the cure of diseases, were not discovered by men of uncommon sense and penetration, but some by mere accident, others by ignorant savages, and others we owe to the chemical enthusiasms of a credulous age, which hot in the pursuit of the philosophers' stone, stumbled on discoveries in medicine and other arts, far more beneficial to mankind than the object they pursued, even had they obtained it; but that few discoveries of this nature were made by men of science in consequence of study and reflection."

Medical Sketches, in two parts,

JOHN MOORE, M.D.—(1786).

Abstracts

CRAWFORD B. SHIER, Editor

Contributors { A. M. Crossland, R. L. MacMillan, G. R. Walker, J. G. Watt, W. R. S. Wilson

ENDOMETRIOSIS OF THE LUNGS

Experimental Production of Endometrial Transplants in the Lungs of Rabbits

JOHN E. HOBBS, M.D., AND A. R. BORTNICK, M.D. ST. LOUIS, MO.

Surgery, Gynaecology and Obstetrics, November 1939

The senior author had surmised for years that fragments of endometrial tissue were transported through the lymphatics and venous channels to the lungs, and became imbedded and grew. This idea seems logical when one considers some known facts.

1. Experimental auto-transplantation of endometrial tissue has been made to ovaries, Fallopian tubes, abdominal wall, cornea of the eye, etc.

2. Menstruating endometrium can be autotransplanted, as was shown by Jackson and others. Sampson's theory of regurgitation of menstrual blood through the tube is probably responsible for the major source of pelvic endometriosis. Fragments of the mucosa become implanted on the ovaries and form chocolate cysts which may rupture and further disseminate endometrial tissue throughout the lower part of the peritoneal cavity.

3. Endometrial tissue has also been found in such structures as vulva, vagina, inguinal region, uterus, Fallopian tubes, ovaries, recto-vaginal septum, intestinal tract, umbilicus, laparotomy scars, thighs, etc.

4. Sampson, Halban and others have demonstrated the presence of uterine mucosa in veins and lymph vessels. This could be the only explanation for the presence of this tissue in the brachioradialis muscle and thigh as reported by Navratil and Kramer, and by Mankin respectively. In these two cases the endometrial fragments would have to progress through the capillary bed in the lungs or pass from the right to the left side of the heart through a patent foramen ovale.

Pathologists occasionally find innocuous, normal syncytial cells in the lung tissue of women who have died during pregnancy or childbirth. It should also be noted that the lungs are one of the first sites of metastasis in chorionepithelioma. This is evidence that cells from the uterus can reach the lungs through the blood and lymph channels. Thus the authors believed that endometrial tissue could be transported in the same way. Might not aberrant endometrial tissue be the cause of vicarious menstruation? Is it possible that ectopic endometrial tissue is the origin of heretofore unrecognized benign and malignant pulmonary tumours? An interesting case, which the authors were only partially able to investigate, stimulated their interest to the crystallizing point concerning this subject.

They began a series of experiments on large rabbits of 2200 grams. Each received 2000 units of theelin intramuscularly two or three days prior to operation in order to stimulate endometrial proliferation. Analgesia was obtained with nembutal 0.18 gm. per rectum and ether inhalations when necessary. A small portion of each uterine horn was removed; endometrial tissue removed by curettage, ground up, suspended in N saline, and injected into the ear vein with a No. 18 gauge needle. This insured that the destination of the tissue was the right side of the heart and from the right ventricle into the arteries of the lungs with a diffuse dissemination. All the rabbits lived 19 days and over.

The animals were examined and two or three blocks taken from suspicious areas in each lung. The lungs of ten normal rabbits used for Friedman pregnancy test were the controls.

The results established the fact that auto-transplanted endometrial tissue would grow in the lungs, and that endometrial tissue could be transplanted through veins to the lungs. Thus endometrial tissue must occasionally reach the lungs and grow. Also endometrial tissue may get to the left side of the heart by passing through a patent foramen ovale or by propagating through the capillaries of the lungs into the pulmonary veins, and thence to the left side of the heart; after this, endometrial tissue may be disseminated, possibly, to any organ of the body. Vicarious menstruation may be due to endometrial implants in the area from which periodic bloody discharge issues. This aberrant endometrial tissue has characteristics which would indicate that it has increased potentiality to become malignant.

C. B. S.

PROBLEMS IN DIFFERENTIAL DIAGNOSIS BETWEEN UROLOGIC AND ABDOMINAL LESIONS

HERMAN L. KRETSCHMER, M.D., F.A.C.S., CHICAGO, ILLINOIS

Surgery, Gynecology and Obstetries, November 1939

Before an accurate pre-operative diagnosis is possible an accurate history taken with great care must be obtained.

Some of the more common problems in diagnosis are:—

Lesions of the Gastro-intestinal Tract:

These constitute probably the largest group that calls for differentiation.. The differentiation of lesions of urinary tract and lesions of appendix is often difficult. An acute pyelitis with negative urinary findings for 24 hours makes the diagnosis extremely difficult. Also in a woman who has had several attacks of pyelitis during one or more pregnancies, and now develops acute appendicitis, it is easy to see how it may be overlooked and the clinical picture attributed to a lighting up of an old infection in the kidney. Again in the group of "chronic" appendicitis cases often a complete urological examination will reveal the diagnosis. Certainly in all doubtful cases the patient should have the benefit of a complete urological survey before his so-called chronic appendix is removed. Some confusing lesions are:— chronic pyelitis, hydronephrosis, renal and ureteral calculi and renal tuberculosis.

Lesions of the Gall Bladder:

These differentiations have become greatly simplified by the more prevalent use of cholecystography and pyelography

Subphrenic Abscess following Pregnancy:

This condition may occasionally be confused with a pyelitis of pregnancy and careful investigation is necessary to reveal the truth.

Cysts of Pancreas:

Urological diagnostic procedures are often necessary to establish the diagnosis.

Lesions of Colon:

These are of interest to the Urologist because they may result in enterovesical fistulae. The lesions more frequently responsible for this are diverticulitis and carcinoma.

Acute Pyelitis following Operation
Lesions of Gynecological Tract
Lesions of spine
Hydronephrosis
Retroperitoneal Tumours
Elusive Ulcer

The above all entail interesting and often difficult differentiation from urological conditions.

Thus the role of the Urologist is a very important one in the differential diagnosis of abdominal disease.

A. M. C.

TREATMENT OF AVULSED SKIN FLAPS

A. W. FARMER, TORONTO

Annals of Surgery, November 1939

Read before the American Surgical Association, Hot Springs, Va.—May 11, 12, 13/39. Four cases of severe avulsion of skin are reported with a new method of treatment.

Technic of Treatment:—The avulsed skin is excised and the underlying traumatized area thoroughly cleaned with aseptic fluids, such as soap and water, and saline. The excised skin is held on a firm, flat surface and the subcutaneous fat removed well into the dermis, by scraping or cutting with curved scissors. The skin is then sewn accurately back into its original position. Quilting sutures are put in and perforations are made. The primary dressing is of normal saline. Pressure is applied by bandaging and immobility maintained by a plaster encasement. The dressing is changed in 10 to 14 days unless there are special indications for earlier examination.

It is doubtful if this method of treatment has been used previously. The results obtained depend chiefly on the degree of infection and the extent of associated injuries. This type of graft gives a much better result than can be obtained with partial thickness grafts employed at a later time. This method saves the damaged tissues from certain death, shortens the period of hospitalization, and gives a better functional and cosmetic result than any other method.

Summary of Criticisms and Reply:—It was brought out that possibly the avulsed skin should not be excised from its remaining attachment and the subcutaneous fat removed. This has been tried but was not successful perhaps due to a good arterial supply from the attached edge without sufficient venous drainage, causing fatal congestion to the flap.

G. R. W.

A CLASSIFICATION OF JOINT DISEASES BASED ON THEIR ETIOLOGY

From "The Diagnosis of Various Arthritides"

BOWER, M.D., BOSTON.

New England Journal of Medicine, Vol. 221, No. 14.

I. *Joint Disease of known etiology*

(1) Traumatic—sprains, strains, fractures into joints, traumatic synovitis.
(2) Infectious—Tuberculosis, Gonococcus, Streptococcus, Staphylococcus, Meningococcus, etc.
(3) Neuropathic—Tabes, syringomyelia nerve injuries, leprosy.
(4) Metabolic that is associated with gout.
(5) Constitutional — associated with hemophilia.
(6) Anaphylactic—serum sickness.

II. *Joint Disease of unknown etiology*

(1) Degenerative hypertrophic osteoarthritis.
  (*a*) primary
    (i) after the 4th decade
    (ii) daily minor traumas.
  (*b*) secondary; ensue in consequence of intra-articular damage resulting from previous acute infections—gouty; trauma.
(2) Rheumatoid Arthritis (Proliferative, atrophic chronic infections).
  (*a*) Typical
  (*b*) Atypical (non specific infections, focal infections, as arthritis)
  (*c*) Spondolyitis (Strumpell-Marie type spondolytis, rhizomelia deformans, etc.)
(3) Rheumatic Fever.

III. *Diseases of other skeletal structures of unknown etiology*

(1) Tenosynovitis.
(2) Bursitis.
(3) Dupuytren's contracture.
(4) Myositis.
(5) Fibrositis.

W. R. S. W.

ARTIFICIAL PNEUMOPERITONEUM IN PULMONARY TUBERCULOSIS AND PREGNANCY

JOSEPHINE BARNES
Lancet, Nov. 4, 1939

Patients with pulmonary tuberculosis on delivery commonly have a flare-up due to the sudden increased excursion of the diaphragm, opening up lesions that were splinted by the increase in intra-abdominal content of pregnancy. This should be prevented where possible by pneumothorax. Where pneumothorax cannot be induced, pneumoperitoneum should be established as soon after labour as possible. The author reports two cases which were successfully treated in this manner and serious flare-ups were avoided. Good splinting of the diaphragm was obtained by this method.

R. L. M.

RELATION OF BLOOD PRESSURE AND CONCENTRATION IN SERUM OF POTASSIUM, CALCIUM AND MAGNESIUM

HOFF, SMITH, WINKLER,
Amer. Journ. of Physiology, Nov. 1939

The above gentlemen perfused dogs and cats with isotonic solutions of potassium, calcium, and magnesium. They found that the first two had no effect on the blood pressure. Magnesium, however, caused an immediate fall in pressure and an increase in skin temperature. This fall was concluded to be due not only to the altered ratio of magnesium in the blood but to the change in absolute level of magnesium. This work is very interesting.

R. L. M.

AN ADDRESS ON ASTHMA

H. K. DETWEILER, M.D., F.R.C.P.(C.)
TORONTO

Canadian Medical Association Journal, November 1939

Three major varieties of allergy are now recognized. They are (1) atopic allergy; (2) bacterial allergy; (3) contact allergy.

Atopic Allergy

Atopy is best exemplified by typical cases of hay-fever, pollen asthma or asthma due to a sensitivity to the protein of foods, animal emanations, and miscellaneous substances such as house dust. Clinically these cases have coryza or asthma upon exposure to the offending substance, and they are relieved or the attacks are prevented by avoidance of the offending substance. They have a prompt skin reaction of urticarial nature when the substance in soluble form is inoculated into superficial scratches in the skin or when it is given by intradermal injection. This is designated as an "immediate" reaction.

Bacterial Allergy

Sterile lesions due to bacterial infection at some other site in the body occur in tuberculosis, syphilis, rheumatic fever and other conditions. The focus of infection produces allergizing substances, which escape into the blood stream and sensitize susceptible tissues in parts of the body remote from the focus of infection. These sensitized areas react to the antigen usually by the production of sterile inflammation. The Mantoux tuberculin test is a good example of this form of allergy. The reaction is not immediate, but requires 24 to 48 hours to develop. Asthma occurring in the course of bronchitis, sinusitis, chronic cholecystitis etc., is believed to be due to such bacterial allergy.

Contact Allergy

Certain types of occupational dermatitis, especially of the hands, are due to an allergic condition. Skin tests for these are often unsatisfactory, and the "patch test" is the one employed. All the manifestations of allergy are in the skin. There is no asthma or hay-fever.

Types of Asthma Not Usually Regarded as Due to Allergy

Cardiac asthma.—About 1 per cent of asthmatics have attacks characterized

by bronchial constriction without evidence of allergy, but with evidence of heart disease. These attacks are relieved by epinephrin. They should not be confused with cases of paroxysmal shortness of breath due to heart disease. These have cardiac dyspnoea and are not relieved by epinephrin.

Nervous asthma.—These cases have no evidence of allergy or of heart disease. They often have business or domestic worries. They are relieved by epinephrin, ephedrin and atropine.

Mixed cases.—The ragweed asthmatic exemplifies this type. His symptoms persist into late fall or winter due to secondary bronchial or sinus infection.

The Treatment of Asthma

Atopic asthma.—(*a*) Avoid the offending substance. (*b*) Alter the specific sensitivity of the patient by inoculations with extracts of the specific antigen, or in the case of foods by feeding small quantities of the offending substance.

Bacterial asthma.—The history of the patient may be one of two types (*a*) frequent recurrences of upper respiratory infection which extends to the trachea and bronchial tree; (*b*) chronic bronchitis secondary to chronic sinusitis, myocardial disease, emphysema, occupational hazards and climate. Avoidance of contact with persons suffering acute respiratory disease, of exposure to cold and wet, and if possible moving to a warmer, drier climate during the winter may give freedom from attacks. A thorough course of inoculations with autogenous or stock respiratory vaccines is beneficial.

Cardiac asthma.—Treat the underlying heart condition.

Nervous asthma.—This requires a careful study of the habits of life of the patient, and an attempt should be made to remove the physical and environmental causes of irritation.

The hypodermic injection of 3-15 minims of epinephrin is the most effective way of relieving the immediate attack. In children the oral administration of gr. 1/4, and in the adult gr. 1/2 of ephedrin by mouth will relieve mild attacks.

Parenteral injection of epinephrin in peanut oil is of especial benefit in cases of status asthmaticus, since it cuts down the number of injections required to keep the patient free of symptoms to two or three in twenty-four hours. Aminophyllin gr. $7\frac{1}{2}$ is also useful in these cases.

J. G. W.

A NEW METHOD OF TREATMENT OF SUBACUTE BACTERIAL ENDOCARDITIS

Using Sulfapyridine and Heparin in Combination: Preliminary Report.

SAUL R. KELSON, M.D.
PAUL D. WHITE, M.D.
BOSTON.

J.A.M.A., November 4, 1939.

Analysis of 250 cases of subacute bacterial endocarditis with positive blood culture for alpha (viridans) and, rarely, gamma streptococci in Boston hospitals stressed the ineffectiveness of all varieties of therapy prior to the new chemotherapeutic drugs. Sulfanilamide used in 24 cases, and prontosil used in five temporarily improved a few. Sulfapyridine used in four cases appeared far more effective but was not curative. From data collected, it is found that sulfapyridine lowers the temperature and sterilizes the blood stream, but these effects pass off in from a few days to a month, rarely more.

Blood of patients with subacute bacterial endocarditis usually has a high titer of antibodies for the organisms, but the bacteria will grow in the serum unless leucocytes are present, then they die quickly. The steptococci lie near the periphery of the vegetation, which is a mass of fibrin, an ideal culture medium and protective barrier, and of platelets.

By present means it appears impossible to increase the number of phagocytes and to draw them into contact with the bacteria, to dissolve the vegetations or to induce granulation within them. One can attempt to

prevent further thrombotic deposition on their surface in order to (1) restrict the nidus and culture medium for bacterial growth; (2) prevent embolism from the freeing of fresh thrombus; (3) check the growth of the vegetations so that proliferating of fibroblasts may fill in these limited areas. The authors used sulfapyridine for its bacteriostatic action, and also anticoagulant crystalline heparin.

Method

4 to 6 gm. of sulfapyridine (with desired blood levels of 5 mgm. per 100 cc. or more) is given daily for four weeks. Heparin is begun four to seven days after sulfapyridine has been started, when nausea and vomiting have subsided and before escape from the effects of sulfapyridine has occurred. The contents of a 10 cc. vial of heparin (10,000 units) are added to 500 cc. of a physiologic soln. of sodium chloride, and the solution is given by uninterrupted intravenous drip day and night for fourteen days. The rate of flow is about 15 to 25 drops a minute and this is carefully regulated to keep the clotting time at approximately one hour (normal is below twenty minutes).

Results

Six patients with subacute bacterial endocarditis and one with acute bacterial endocarditis caused by the same organism were treated by the above method. Each had four or more positive cultures.

Two of these patients were able to take the heparin for only an hour and a half because of reactions to a toxic lot of the drug, too short a time to expect any lasting effect on thrombus formation. Two other patients were able to continue the heparin for only three days and two days respectively because of the serious course of the disease itself which terminated fatally in less than two weeks.

The remaining three patients were able to take heparin for more than a week, a length of time adequate to produce an important effect on thrombus formation. All these patients showed striking improvement, and have been free of evidences of the disease for 19 weeks, 18 weeks, and four weeks respectively after discontinuing treatment. With these results they contrasted 246 follow-up cases: afebrile intervals were rare for as long as five weeks once fever had set in, and no case remained free of signs and symptoms for that length of time except one boy who did so for a whole year without specific therapy only to die of rheumatic fever.

The authors recognize the danger of excessive bleeding incident to embolism in these cases, but believe that the hopeless prognosis of the disease without this treatment merits the risk. The chances of healing the vegetations are best when they are small, making early diagnosis all important.

Since this treatment is still in the experimental stage they do not advise it except in the earlier cases or less seriously ill, and only then under carefully controlled conditions.

Blood transfusions are given if there is an anaemia of 3,500,000 red blood cells or below. The persisting infection predisposes to vitamin C deficiency which interferes with fibrous repair, so all these patients are saturated with 200 mg. of ascorbic acid by mouth four times a day for three weeks and then continued on 100 mg. a day.

This new treatment, although not entirely successful, gives more promise than any other method previously suggested.

J. G. W.

Book Review

COMMON PROCEDURES IN THE PRACTISE OF PAEDIATRICS

By ALAN BROWN, M.D., F.R.C.P.(C.) AND FREDERICK F. TISDALL, M.D., F.R.C.P.(C.)

305 pages, $5.00. McClelland & Stewart, 1939

This book is "a detailed description of diagnostic, therapeutic and dietetic methods employed in the Hospital for Sick Children, Toronto". It appears now in a revised and enlarged form—the third edition.

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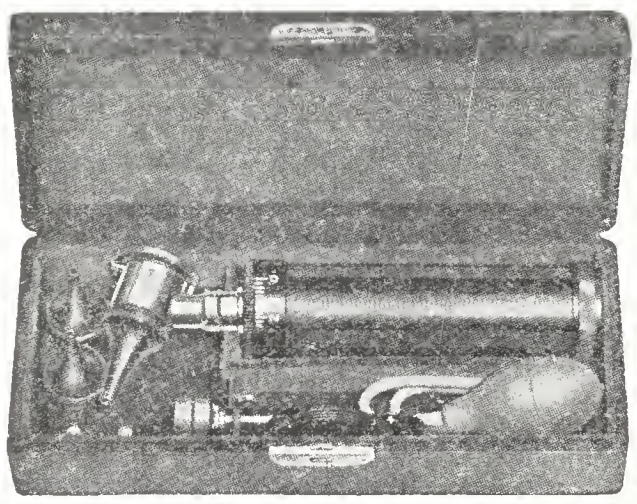
K. C. G.



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Feature Section

F. L. LAWSON, Editor

THE FACULTY OF MEDICINE OF McGILL UNIVERSITY

By R. H. DENNETT

The Medical Faculty of McGill University was established as the first medical school in Canada in the third decade of the nineteenth century. The Montreal Medical Institution, an earlier teaching body of which the McGill Faculty is the direct continuance, was founded in the year 1822-23 by the first medical staff of the Montreal General Hospital, Drs. William Robertson, William Caldwell, Andrew F. Holmes, and John Stephenson. The young institution sprang at once into activity and carried on with a full curriculum but without University status, until the year 1829. At this time McGill College, though founded in 1811 by the will of James McGill and incorporated in 1821, as yet existed only on paper. In order to fulfill the conditions of the will and to secure the bequest of the founder, it had become essential for the University to institute academic activities, although finances were entirely lacking. The Royal Institution for the Advancement of Learning, the trustee under the will, took cognizance of the teaching body in the city and formally "engrafted it upon" the College as its Medical Faculty. Through this arrangement the new Faculty by its activity literally saved the property of James McGill to the educational purpose for which it was designated and thereby rescued the College from protracted litigation, if not from final defeat.

The medical school was thus the pioneer Faculty in the University and it continued to be the only one in active operation during the next twenty-five years of the latter's existence. It was also, through its devoted secretary, Dr. John Stephenson, the instrument whereby the requisite authority to confer degrees was obtained. Its founders are therefore to be regarded as the founders also, in the academic sense, of the University as a whole. In these particulars, its record is unique in the history of early medical schools on this continent.

In other ways also, the story of its origin reveals an honourable and heroic past that establishes a great tradition. It was founded in a time when political dissensions were rife, under great material difficulties and at the cost of much personal labour and sacrifice, by men who, as in the case of the Medical Faculty of Pennsylvania, were of high professional status, and, following the methods of the parent Edinburgh school, made clinical instruction at the bedside an integral part of the hospital routine and an essential feature of their curriculum. So faithfully was this principle adhered to by this early teaching staff and their successors, that it remained the hall-mark of this Faculty, and, during the ensuing fifty years, the "clinical advantages" of McGill were recognized both in England and America as among the greatest available. It was indeed this early reputation which brought, at a later period, the distinction of numbering among its graduates and on its early professoriate one of the greatest clinical teachers and leaders of medical thought in his time, William Osler, who graduated from McGill in 1872, and held the appointment of pathologist to the Montreal General Hospital and the chair of the Institutes of Medicine here during the first ten years of his academic life (1874-1884). In Osler's own view, this early experience was fundamental to his later progress to the status of a great clinician, and it permeates and lives again in nearly all his later medical publications. His loyalty to his Alma Mater and his acknowledgement of the

value of this early influence in shaping his later career found fitting expression, after his death in 1919, in the gift under his will to his old school of his great collection of books on the history of medicine, now housed in the Osler Library of the faculty, and in the touching bequest of his ashes, which repose there behind his portrait, surrounded by the most beloved of his books.

The tragic death in 1833 of Dr. Caldwell made the first break in the ranks of the four veteran teachers. The gap was temporarily filled by Dr. John Racey and on his removal to Quebec two years later, in 1835, by the appointment of G. W. Campbell to the chairs of midwifery and surgery, and Archibald Hall to that of materia medica. Both these men were graduates of Scottish Universities, Dr. Campbell of Glasgow, and Dr. Hall of Edinburgh, and their activities in the next thirty odd years were probably the most essential factors in the rapid expansion and stabilization of the medical school that now ensued, and in the organization of the Canadian medical profession on a conservative educational basis.

The real growth of the medical school did not begin until 1841-42, when the yearly attendance of students, which had averaged twenty-five up to this time, rose to thirty-nine. For some time thereafter progress remained slow, there being only forty-four students in 1849-50. In 1850-51, however, there were fifty-three enrolments, and from then on the numbers advanced steadily. At the present time the yearly registration is limited to 100 students, and the enrolment is therefore about 480. With the graduation of the present fourth year class in 1940, the school will be entirely a four-year instead of a five-year course, and the number will probably drop to 400 and remain there.

The first lectures were delivered at "the house of the Institute" No. 20 St. James Street, a small building on the north side of what is now Place d'Armes Square. The School remained here for some years and then removed to a tall narrow building on Fortification Lane. Later, some time after 1833, the Faculty established itself in a large three-storey brick building which is still standing on the west side of St. George Street. In 1845 the medical faculty was invited to occupy the Arts building of the University, itself erected in 1843. They remained there for five years, but since it was so far from the Montreal General Hospital, the students petitioned for the lectures to be held once more in town. Three members of the faculty, Drs. McCulloch, Campbell, and Sutherland, undertook to erect a suitable building at private expense, and to rent this to the faculty, the rent received to be ten per cent of the outlay, and the faculty to pay the assessments. The lot purchased for the purpose was in the close vicinity of the Montreal General Hospital. Here the school remained until 1872.

Here at 15 Cote Street, for twenty-one years, the sure foundations were laid for the later era of relative prosperity that ensued. Here in 1853 all ten of its lecturers were appointed professors, and here in 1854 Dr. Holmes became its first dean. New appointments were made and new courses opened, examinations divided into primaries and finals, a summer session established and the number of students rose to 184 in 1866-67. Here Dr. R. Palmer Howard, professor of medicine and dean of the faculty from 1882 on, by his sound and up-to-date teaching at the bedside in close correlation with the autopsy findings, gave the first impetus to the foundation of a chair of pathology. Here Osler graduated, George Ross and Richard L. Macdonnell taught, and F. J. Shepherd was an undergraduate—members all of a group of eager young clinicians who were, a few years later, to take a leading part in the coming of age of scientific medicine and surgery on this continent.

The number of students continued to increase steadily and again overflowed Cote Street's capacity. The faculty began to look upon the university grounds as their proper home. The rapid growth of the city to the westward had removed the old objections to this location, and even rendered it a more suitable spot than a place nearer the hospital, in what promised to become one of the poorer quarters. Accordingly,

in the year 1871, the university erected a square stone building on the University Street side of the college property. Three successive additions were made to this modest single block of 1872—that of 1885 for the accommodation of 300 students, that of 1895-96 for the establishment of pathological and public health laboratories, to the fine new building of 1902. In 1907 this fine Medical Building, the pride and joy of the Faculty, was destroyed by fire, and in 1911 the present Strathcona Medical Building was erected from funds obtained from the fire insurance and $450,000 from Lord Strathcona, on a site farther up on the hillside commanding a fine view of the city and in closer proximity to the Royal Victoria Hospital, which institution had been founded by Lord Strathcona and Lord Mount Stephen in 1894. This new Medical Building, a handsome stone structure of modern construction, was made to house the administration offices, library, and museums, and the departments of anatomy, pathology, pharmacology, and public health.

The new building of 1911 was erected and opened under the administration of Dr. F. J. Shepherd, professor of anatomy for thirty years from 1883 on, and dean of the faculty from 1908 to 1914, whose eminence both as a surgeon and educationalist were important factors in the advancement and growing reputation of the school. Since 1911 also an immense expansion has taken place largely in the direction of medical research, the first impetus to which may be said to have been given by the work of Wyatt Johnson (1860-1902) and Professor J. G. Adami (1862-1926). Financial support was supplied in 1911 by the Robert Reford Endowment of $100,000 for the department of anatomy, and by various other funds and gifts leading up to the great centenary year of 1921 when $6,000,000 was given to the University, of which $4,000,000 was subscribed by the graduates and friends of the Institution, $1,000,000 was given by the Province of Quebec, and $1,000,000 was donated from the Rockefeller foundation, the latter sum being a grant for the special uses of the medical faculty.

In 1922 the Biological Building was opened, housing the new department of biochemistry in which the researches of Professor J. B. Collip and his associates have brought such well deserved fame to the school; in 1923 was built the fine Pathological Institute; in 1924, the University Clinic for Researches in Internal Medicine was established under the direction of Professor J. C. Meakins, with the help of a grant from the Rockefeller Foundation of $500,000; in 1925 came the erection of the Royal Victoria Montreal Maternity Hospital, with accommodation for 200 patients and presenting the last word in equipment, under Professor W. W. Chipman; a department of child study was instituted with the help of a grant of $56,500 from the Laura Spelman Rockefeller Memorial Fund; in that year also the departments of public health and preventive medicine were united under the directorship of Professor Grant Fleming, now Dean of the Faculty; in 1927, a subdepartment of industrial medicine with an industrial clinic at the Montreal General was established by a grant from the Metropolitan Life Insurance Company of $25,000; in 1928, the department of bacteriology was recognized as a separate chair and acquired Professor E. G. D. Murray of Cambridge of international fame.

In 1929 a laboratory for experimental surgery was built and equipped by friends of the Faculty and $85,000 was donated by the Rockefeller Foundation for surgical researches therein. During 1932-33 an additional $100,000 was granted from the same source to maintain the research activities of the department of neuro-surgery. In September of 1934 the crowning event of the benefactions listed above occurred with the opening of the Montreal Neurological Institute under the direction of Professors Wilder Penfield and W. V. Cone. Dr. Penfield was "enticed" to McGill in 1928 on the initiative of Dr. E. W. Archibald under the promise of financial support from a few public spirited citizens and the help of the research funds of the faculty. The creation of the present magnificently equipped neurological institute was made possible

by large endowments for its building and ukeenp, which include a grant from the Rockefeller Foundation of $1,232,-652, and liberal yearly grants of $15,000 from the City of Montreal and $20,000 from the Province of Quebec as well as munificent gifts from several private donors—Sir Herbert Holt, Mr. J. W. McConnell, Mr. Walter Stewart, and four others who wish to remain anonymous. The Institute is thus a civic, national and international affair, in affiliation with McGill but independent of it in funds, and functioning for the benefit of the community at large without restriction of place or creed.

Also affiliated with McGill are the Children's Memorial Hospital, which has 300 beds, and which in 1933 took over the Montreal Foundling and Baby Hospital; the Alexandra Hospital for Infectious Diseases, opened in 1906, which has 172 beds; the Verdun Protestant Hospital, for instruction of students in the diagnoses and treatment of psychoses, which has 1,100 beds; and the Royal Edward Institute, which in its new building has space for 23 beds, and is essentially a dispensary for tuberculosis.

Material for this article was taken from a longer article by Dr. Maude Abbott, published in *Surgery, Gynecology and Obstetrics*, for February, 1935.

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Medical Society Notes

By PAGE STATTEN, Secy.-Treas.

Congratulations are in order for Mr. Baird and his committee in charge of arrangements for the Soph-Frosh dance, held in Hart House on November 3rd. The dance was a real success in every way. The music supplied by Richard Avonde and the cuisine served in the faculty dining-room could not be criticized. We understand that the party was a financial success. Especially gratifying was the number of students of the first and second years in attendance. This is just another indication of the keen spirit of the sophs and the frosh that we have noticed in their enthusiastic displays in some of the interfaculty activities. More power to you men!

We feel that it may be a good idea to continue to have the Soph-Frosh dance informal. Although it may not have quite the atmosphere of a formal dance it enables many students to attend at least one faculty social function who would not be able to if it called for formal dress. For those desiring a more exclusive function may we heartily recommend the Medical-at-Home on January 26th.

Again the mighty Meds. machine has brought fame unto our Faculty! I am speaking now of that great chariot race held during the intermission of the Varsity-Queen's game. This definitely establishes Meds. as the leaders over S.P.S. in this ancient and revered sport. Rumour has it that "School" is considering importing recruits for next year's conflict. These reports have not as yet been confirmed, however.

At the time of writing, plans have just been completed for the first Open Meeting of the Medical Society for this term. The speaker is Dr. I. B. Erb, Pathologist at the Hospital for Sick Children, who has chosen for his subject, "The Prisoner at the Bar". These Open Meetings are planned in the interests of all the Medical students. Their success depends upon your support. In every case the speaker has put a lot of time and effort into his subject, and he deserves a large audience.

At present the fate of Daffydil lies in the hands of the Faculty. A letter has been sent from the Medical Society to the Faculty Council expressing unanimous approval for the continuation of Daffydil on definitely modified grounds. We understand, however, the feeling of the Faculty on this subject. A great deal of criticism has been given concerning Daffydil. The criticism falls not on the students, but on the Faculty. In these times in particular we agree that we should not leave ourselves open to the disapproval of people not connected with our faculty. Daffydil was discontinued during the years of the last war. If it is continued during these years we feel that it should be modified to prevent adverse criticism. A good wholesome show would satisfy everyone.

The Medical Society is at present studying the question of the twenty-five dollar raise in fees this year. It is a problem that concerns all students, and yet little or no explanation has been offered to the students about it. At the same time a charge has been made for Directories. This publication was previously given to the students. It is felt that students will not bother getting directories. This will undoubtedly cut down on social relationships between students, which is a step in the wrong direction.

Plans are being made for the revision of the Constitution of the Medical Society, whereby the C.A.M.S.I. will be incorporated within it. After two years of successful operation in an unofficial way, the Medical Society feels that the C.A.M.S.I. is an indispensable organization. Its work in organizing the Intern Board, though not perfected yet, is probably its outstanding achievement on this campus. Other aims are in the realm of student health, scholarships, and Intern Welfare. It is planned to run the local branch of the C.A.M.S.I. as a committee of the Medical Society, with the President as a member of and responsible to the Medical Society.

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Medical Athletics

By D. R. CLARK, Secy.-Treas.

By the time this article goes to press the standing of the various faculties in the T. A. Reed Trophy competition will no doubt be changed but at present Meds. are in second place.

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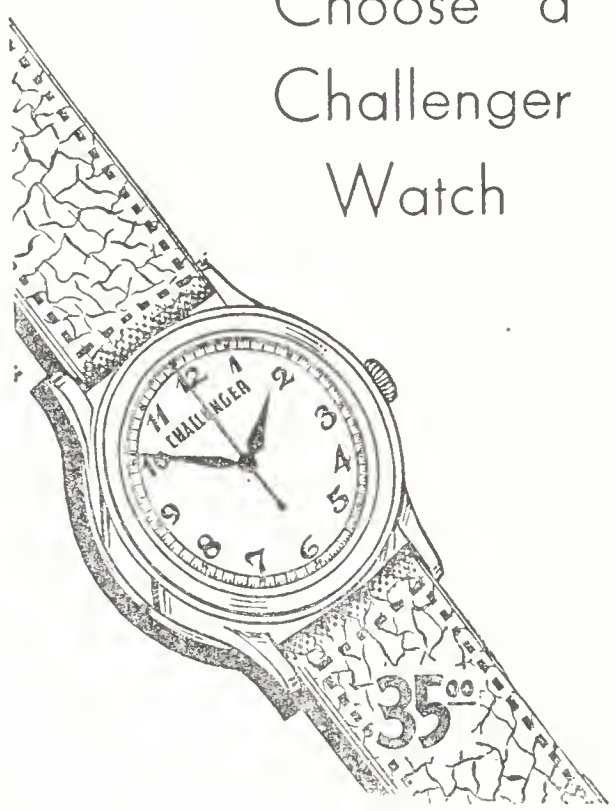

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A good deal of the credit for the present standing in this trophy race is due to the fine efforts and spirit of the members of the track and harrier clubs. The junior track club are interfaculty champions, the senior club took second place in the senior interfaculty track meet and the harrier entrants collected some five hundred and seventy points due primarily to the fine turnout of members of 4T4 and 4T5. Incidentally, have you heard of the *Thunder Mug*?

Although the senior rugby team will not have its name on the Mulock Trophy this year they proved themselves worthy defenders of the title. To the team members—your supporters were no less disappointed than you—lots of luck for next year.

Other Meds. teams which are in competition at present are Lacrosse, Volleyball, Soccer, Rowing (scored a third in the faculty fours), and Junior Swimming.

This year we are organizing two new interfaculty teams, namely, Badminton and Fencing. Watch for notices regarding these innovations. To those interested who do not know the fine points of the sports—there is no time like the present to learn.

The James Kinnear Memorial Trophy for intrafaculty squash competition is once again up in competition. The tournament is now well under way. The winner will be declared by December the twentieth. The four semi-finalists in this tournament will represent Meds. in the interfaculty squash competition to take place the early part of January.

The executive committee takes pleasure in announcing the acceptance of the office of Honourary President of the Medical Athletic Society for the current year by Dr. R. F. Farquharson of our staff. We are indebted to Dr. Farquharson for his willingness and enthusiasm to be of assistance to the executive committee and hope that during his term of office Medical Athletes will be successful in carrying off top honours in the T. A. Reed Trophy Race.

C.A.M.S.I. Notes

By A. J. DENNE

At the time of going to press no open meeting of C.A.M.S.I. has been announced but will no doubt have taken place before this is read. However, there has been considerable C.A.M.S.I. activity going on and the chief evidence of this is the operation of the Intern Board which is aiding the graduating years of all associated Canadian Medical schools in securing their appointments as junior interns in the various Canadian Hospitals. It is doing this in a manner which it is felt will be most advantageous to both graduate and hospital. The set up and operation of this Board will be the subject for a future column in the spring when another potential final year will be up against the problem of obtaining an appointment.

A rather momentous step in C.A.M.S.I. progress is soon to be taken on this Campus when your Medical Society formally tie our organization under its wing. To date C.A.M.S.I. has not officially had a connection with the Medical Society, although in our constitution one of our executive must be on the Society. However, a committee has been appointed to investigate the best possible way of relating C.A.M.S.I. activity to the Society and it is likely that it will operate as a sub-committee similar to the Athletic Society, Journal executive, etc. Such is the arrangement at McGill.

About now would seem to be a good time to outline to the junior years what C.A.M.S.I. is and what its objectives are.

Canadian Association of Medical Students and Interns

Purpose:

(1) Further the welfare and interests of Canadian medical students and interns.
(2) Facilitate cooperation between medical students and faculties; interns and hospital staffs.
(3) Afford a medium of interchange of ideas between students of different medical schools.

More specific problems which concern the C.A.M.S.I. with respect to Medical students are:

Health:

(1) Investigate present conditions of health.
(2) Determine efficacy of existing systems of health examination.
(3) Study present incidence of tuberculosis—evolve an active programme for radical measures ensuring the early detection of tuberculosis.
(4) Determine feasibility of health insurance for medical students.

Education: Cooperate with the medical faculties in their endeavour to raise educational standards by conveying to them the students' and interns' opinion on problems of curriculum.

Book Cooperatives: Investigate the possibilities of forming cooperative book and instrument stores.

National Scholarships: The C.A.M.S.I. should acquaint itself with the movement conducted by the Canadian Student Assembly in obtaining a Dominion grant for increased scholarships to University students and should lend its support to this campaign.

Publications: This it has been suggested could be done through the medical Journals of the respective schools. Other methods are under investigation.

With respect to interns, a somewhat similar list of aims has been drawn up but to date relatively little has been done to organize committees to work toward these aims. When the National Conference convenes this February at Queen's University this problem is to be dealt with and some more definite action will no doubt be taken.

Some of the results of work on the above aims to date were printed under C.A.M.S.I. Notes in the last issue and may be referred to. We close with the hope that a large turnout of interested students will be held at an open meeting soon to be called.

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How much more likely, then, that rickets will develop among city-bred children who live under a smokepall for a large part of each year. True, vitamin D is more or less routinely prescribed nowadays for infants. But is the antiricketic routinely administered in the home? Does the child refuse it? Is it given in some unstandardized form, purchased from a false sense of economy because the physician did not specify the kind?

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